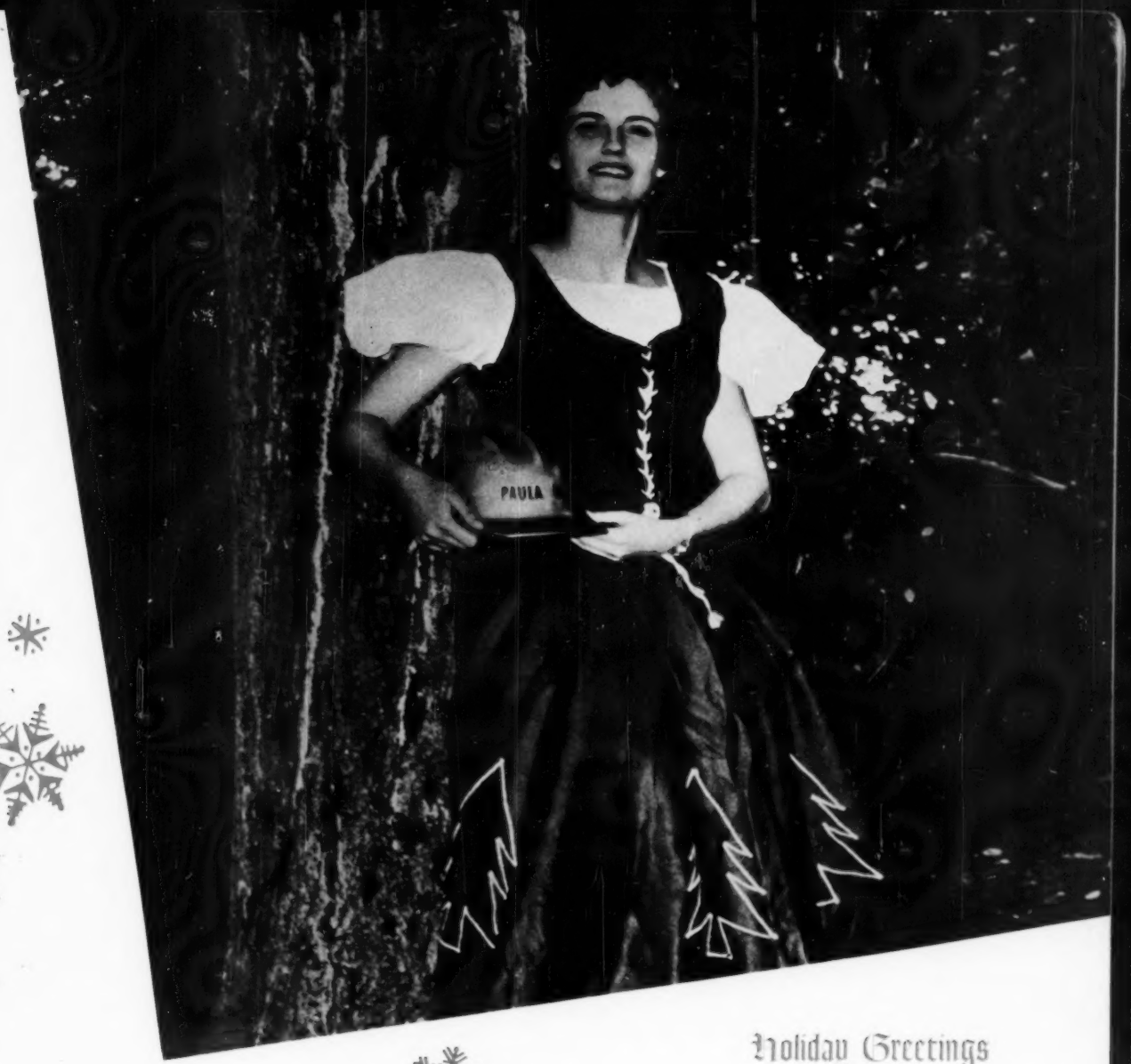

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SINCE 1901, AMERICA'S PIONEER INDUSTRIAL SAFETY MAGAZINE • DECEMBER, 1961 • 50¢

Published By Alfred M. Best Company, Inc.

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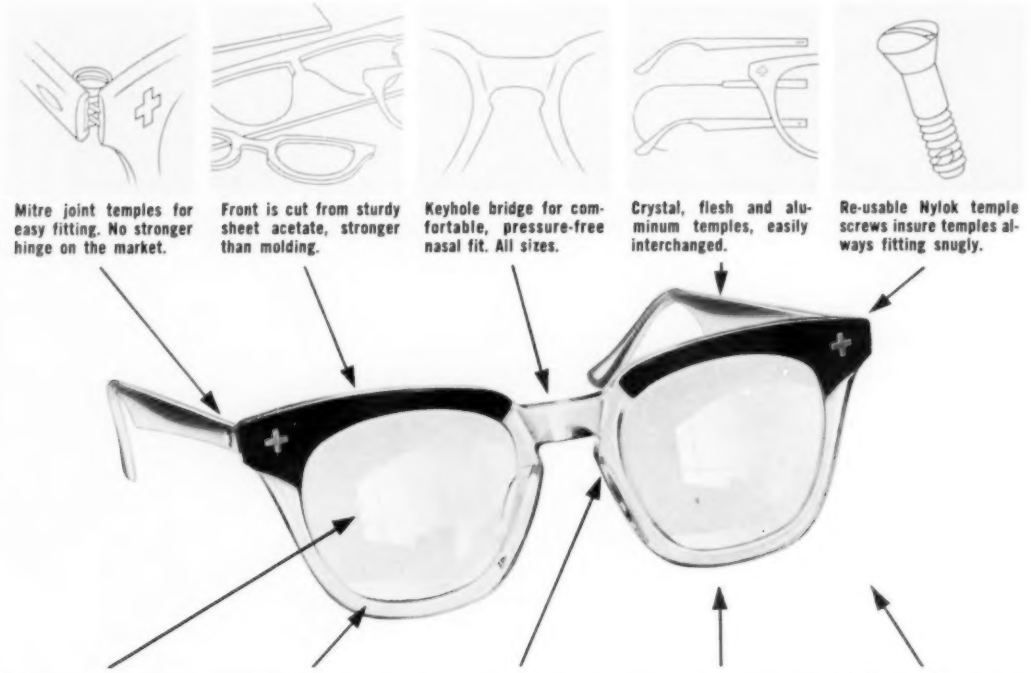

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Safety Maintenance

Affiliated with "SAFETY ENGINEERING"

Vol. 122, No. 6 **December, 1961**

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Cover picture: "Paula Bunyan"—Safety Symbol of the U.S. Forest Service.

SINCE 1901, AMERICA'S PIONEER INDUSTRIAL SAFETY MAGAZINE

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Postmaster: please send change-of-address notices to: Safety Maintenance, Best Building, 75 Fulton Street, New York 38, N. Y.

it's SAFE to say

● UNDER THE SKIN

Tell the average man that his income tax will be increased by 10% next year and his groans will come through in stereophonic sound. Tell the same man that we have "loaned" another emerging nation a hundred million dollars and either the cries of anguish drop to a whisper or his interest wanes altogether.

So it is in the case of the mounting costs of industrial disease. Speakers appearing on the rostrums of safety meetings rarely can hope to galvanize their audiences into action when they talk about just one industrial ailment costing the nation upwards of a hundred million a year. Perhaps we would accomplish more by emphasizing that fully half of every dollar paid out in industrial disease claims goes for the extravagance of skin disease. Costly as it is, skin disease does not sound very dramatic. Certainly, there is not that aura of tragedy conjured up by a threatened loss of eyesight or a hand amputation.

In the wake of heightened employment, first-time industrial personnel and new processes and thus new dangers, we can expect increased costs. Even now, about 70% of all reported occupational disease is caused by the various dermatoses (inflammation of the skin). Chances are that figure would be higher but for the wall of reticence which tends to inhibit references to a mild, merely uncomfortable skin disease suffered by the same man who becomes a colossal bore when complaining loudly of his aching back!

★ ★ ★

Aside from the *mechanical* causes of skin inflammation, such as friction, sudden injury or pressure, the greatest offender is exposure to chemical agents such as solvents, cutting oils, chromic and other acids, dyes, alkalis, resins, salts, poisons, etc. Even the oil of cashew nuts can produce serious dermatitis and blisters if the exposure is long enough.

Unlike a cut finger, a bruised shoulder, a bump on the head or a fractured toe, many cases of dermatitis span a long treatment period. Others almost seem to defy a complete cure. So the best treatment is *prevention,* the first step to which is personal cleanliness.

Obviously, if a worker suddenly develops any skin inflammation, professional medical advice is necessary not only for immediate treatment but to determine whether transfer to another job is indicated. But prevention for *all* employees is the responsibility of management to cut down the waste of dermatitis, now so widely compensable.

Since oil-soaked clothing or garments permeated with diverse chemical agents are neither comfortable or safe, personal protective apparel must include not only gloves but aprons, sleeves, face shields and some form of protection for the lower limbs and feet. Barrier creams can be of great value in warding off certain types of skin troubles, *provided only* if the burden of proof of efficacy can be thrown upon the shoulders of the manufacturer. Certain types of creams can do much to cut down the incidence of skin diseases when the buyer can be sure that those creams have come through exhaustive tests as specifics in the presence of certain chemicals. The ordinary all-purpose hand cream is worse than useless because of false security.

Your safety supplier is the first step to help you beat the nation's No. 1 Skin Game!

As a rule of thumb . . .

"YOUR SAFETY NEWS" CUTS COSTLY ACCIDENTS

YOUR SAFETY NEWS is a safety punching brochure that has become the official monthly house organ on safety for many prominent companies. This unique bulletin, with its diversified safety themes has been used successfully to create millions of safety-thinking employees all over the United States. It delivers down-to-earth safety hints with a **FRIENDLY NUDGE!**

IT HAS A LONG RANGE EFFECT ON YOUR SAFETY PROGRAM . . . By

REDUCING ACCIDENT RATES by producing safe-thinking employees.

LOWERING INSURANCE COSTS by lowering your accident frequency.

PREVENTING COSTLY WORK STOPPAGE by giving helpful safety tips designed to build in an awareness of hidden hazards.

IMPROVING EMPLOYEE RELATIONS by your continuing expression of concern for their welfare.

AN IMPORTANT FACTOR TO CONSIDER ALSO . . . Your Safety News may be personalized with the imprint of your company and the actual signature of an appropriate executive of your firm. This personalization makes Your Safety News . . . **YOUR SAFETY PUBLICATION.**

ALL THIS FOR AS LOW AS 2½¢ per copy; a real safety value. The prevention of just one costly accident will certainly justify this low price. Don't you think so? Then read complete details on following page.

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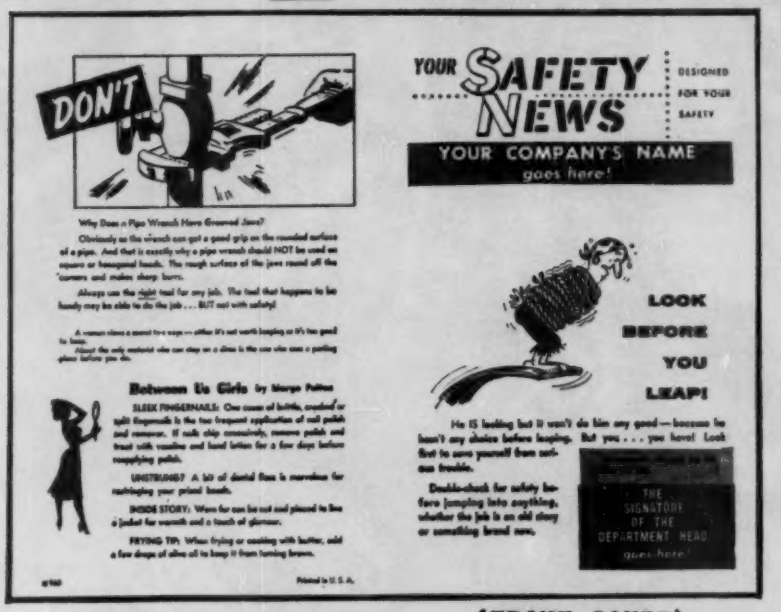
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YOUR SAFETY NEWS
DESIGNED FOR YOUR SAFETY
YOUR COMPANY'S NAME goes here!
LOOK BEFORE YOU LEAP!
THE SIGNATURE OF THE DEPARTMENT HEAD goes here!

(BACK COVER) (FRONT COVER)

Both sizes have the same interesting content that has been so enthusiastically accepted by Industry during the past decade. Once you start using YOUR SAFETY NEWS, you'll find that it produces a lasting effect on your employees by creating the frame of mind that stimulates safe thinking.

Of interest to your employees because it . . .

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New Durasafe glasses combine latest safety features and sturdy construction with wide choice of fitting qualities, colors and combinations, both plastic and metal.

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'Red Devil' respirator (R-2090), with variable density filter, is highly efficient. AO offers a complete respirator line, plus portable rescue breathing equipment.

New flexible mask welding goggle (No. 488) is lightweight, cool, comfortable. Standard welding and cover plates fit easily into nylon holder, allow wide-angle vision.

New Paint Spray Respirator. Compact and light in weight, this Bureau of Mines approved unit is one of 17 filter combinations possible with an AO R-5000 series respirator.

AO 710 splash goggles for chemical operations and where humidity is a problem. Protect against spray, splash, flying particles. Full line of flexible mask goggles also available.

No. 9716 fiber glass welding helmet has narrow front, lift front glass holder. Adjustable, all-plastic headgear, four positioning stops. Check AO for full welding line.

For details, contact your nearest AO Safety Products Representative.

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Remember—everybody benefits from payroll savings. Your employees, your company, your community and your country. It not only encourages thrift and patriotism, but provides vital reserve buying power in your own community.

The State Director of the U. S. Savings Bonds Division will be glad to help. Call on him for specific ideas that work or write to: Treasury Department, U. S. Savings Bonds Division, Washington 25, D. C.

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Over our shoulder

Can we actually "hear" accidents? We certainly can if we remember that we're dealing with people, not inanimate machines, and learn to "listen" (Page 12). American Tel & Tel Safety Engineer, Dr. Earle S. Hannaford tells how to listen and look for accidents which have symptoms just as in other ailments. Perhaps "accident carriers" can be spotted as quickly as Typhoid Mary.

Meet "Paula Bunyan" . . . and seeing her photo (Page 15), a lot of us would like to! She's a very real, very attractive young secretary of the United States Forest Service. Paula is the mythical daughter of the legendary woodsman, Paul Bunyan and she is the personality safety symbol in the stepped-up safety drive of the Forest Service. Why not appoint a Safety Sue in YOUR organization?

A double role for fall-out shelters. No one wants to think of the possible need for a shelter against the ghastly effects of nuclear blast and radioactive fall-out. However, many companies (Page 17) have not wasted space in providing a protection area which they can use NOW as a plant cafeteria, recreation room or meeting hall. Preparing for possible emergency need not mean crepe-hanging.

Safety needs packaging and merchandising. Merchant Princes of America would still be mere "commoners" if they had'nt learned to merchandise their wares and CREATE THE DESIRE AND NEED. Here's one company who conducts an annual "sale" of safety shoes with marked-down, year-end special prices to encourage foot protection (Page 18). Management finds that a pair of shoes is far cheaper than toe injuries; the wearer KNOWS safety shoes are not only cheaper but hurt less!

He used his head to save his life. When a 15-lb steel wheel pulley fell 39 feet from a scaffold post, the force was enough to crack a skull and even kill an unprotected workman (Page 21). But what happened? Just a split laminated plastic safety helmet and only a very minor injury with the man back on the job instead of in a box.

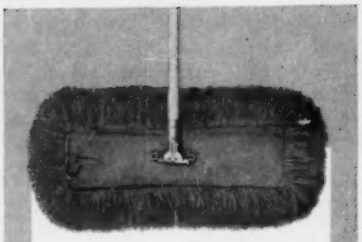
Industry's most useful tool is not some complicated gadget dreamed up by electronics engineers. It's just the human hand. Here's a campaign called, "Fight for Five" found effective by Army Ordnance (Page 22) and given our salute for the safety idea of the month. A huge mock-up of the human hand emphasizes wearing proper gloves and hand protectors, following safety procedures and paying strict attention to the job at hand (for which "oopsy" pun, please forgive us!)

Were you there? At the National Safety Congress and Exposition in Chicago? If not, here are some of the highlights (Page 23), because even if you were present, it would have been physically impossible to take in all the hundreds of sessions.

Six common mistakes . . . in handling flammable liquids (note: we don't call them "inflammable"). Using wrong equipment; failure to ground dispensing equipment; failure to label containers; unnecessary transfers; improper waste disposal; failure to respect obvious dangers (Page 32).

UP AND COMING

Watch for: Why and how hard hats are tested . . . with the RIGHT safety hat (not the bargain-basement substitute) it's heads you win; a picture story on a new nail-driving tool with safety features for high-speed production; the second part of the series on machine guards with the revised, up-to-date American Standards safety code for machine guards; third part of the Floor Maintenance series describing AND SHOWING recent developments of the past year in floor maintenance equipment and supplies; semi-annual volume index listing all major material published in the preceding six issues . . . Features in January.



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THE FUTURE SHOWS

Philadelphia, Pa. *January 22–25*

Thirteenth Annual National Plant Engineering & Maintenance Conference and Show (Convention Hall). Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Dayton, Ohio *February 7*

Tenth Annual Miami Valley Safety Conference and Exhibit (Biltmore Hotel). Safety Council, Dayton Area Chamber of Commerce, Biltmore Hotel, Dayton 2, Ohio.

San Francisco, Calif. *February 8–9*

Twelfth Annual Governor's Industrial Safety Conference (Fairmont Hotel). Michael Flagg, Coordinator, 455 Golden Gate Ave., San Francisco 2, Calif.

Little Rock, Ark. *March 4–6*

Twenty-Third Annual Southern Safety Conference and Exhibit (Marion Hotel). W. L. Groth, Executive Director, P. O. Box 8927, Richmond 25, Va.

Washington, D. C. *March 6–8*

1962 Biennial President's Safety Conference on Occupational Safety. Bureau of Labor Standards, Dept. of Labor, Washington 25, D. C.

Philadelphia, Pa. *March 7–8*

Twenty-eighth Annual Regional Safety & Fire Conference and Exhibit (Bellevue-Stratford Hotel). Harry H. Verdier, Executive Director, Safety Council, Chamber of Commerce of Greater Philadelphia, 121 S. Broad St., Philadelphia 7, Pa.

Fort Wayne, Ind. *March 20–21*

1962 Northeastern Indiana Safety Conference and Exhibit. Ivan A. Martin, Manager Ft. Wayne Safety Council, Chamber of Commerce Bldg., Ft. Wayne, Ind.

Dallas, Tex. *March 25–28*

1962 Annual Texas Safety Conference (Adolphus Hotel). J. O. Musick, General Manager, Texas Safety Association, 830 Littlefield Bldg., Austin, Tex.

Boston, Mass. *April 2–3*

Forty-first Annual Massachusetts Safety Conference and Exhibit (Hotel Statler Hilton). Bert Harmon, Manager, Massachusetts Safety Council, 54 Devonshire St., Boston 9, Mass.

New York, N. Y. *April 9–13*

Thirty-second Annual Greater New York Safety Convention & Exposition (Hotel Statler Hilton). Arthur F. Fuller, General Chairman, Greater New York Safety Council, 60 E. 42nd St., New York 17, N. Y.

Los Angeles, Calif. *April, 17–19*

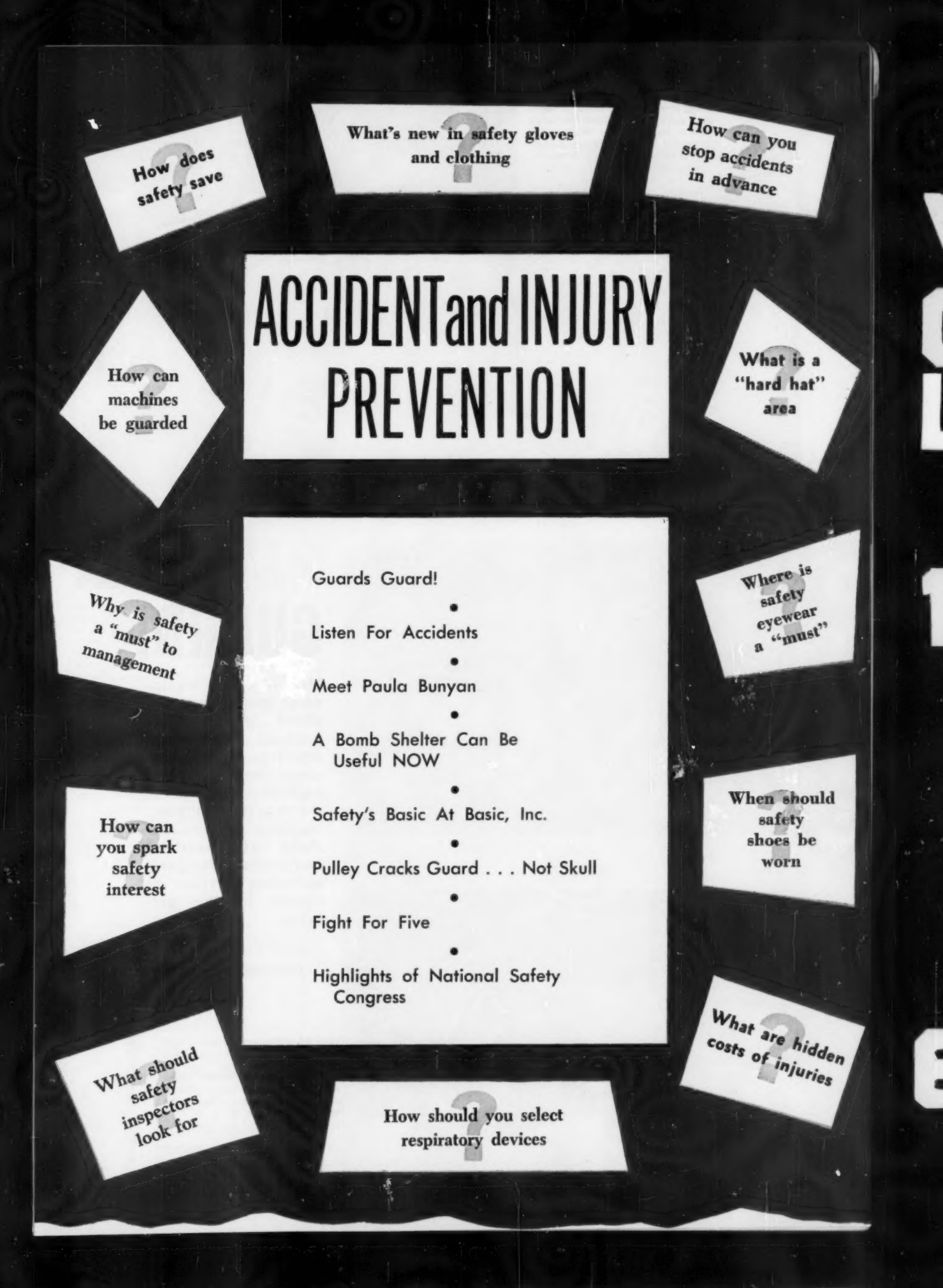
Ninth Annual Western Safety Congress and Exhibits (Ambassador Hotel). Joseph M. Kaplan, Manager Greater Los Angeles Safety Council, 3388 W. 8th St., Los Angeles 5, Calif.

Columbus, Ohio *April 17–19*

Thirty-second Annual All-Ohio Safety Congress & Exhibit (Deshler-Hilton Hotel and Neil House). A. W. Moon, Congress Manager, Division of Safety & Hygiene, The Industrial Commission of Ohio, 700 W. 3rd Ave., Columbus 12, Ohio.

Philadelphia, Pa. *May 21–25*

Sixty-sixth Annual Meeting of the National Fire Protection Association (Sheraton Hotel). Deuel Richardson, Public Relations Mgr., NFPA, 60 Batterymarch St., Boston 10, Mass.


How does safety save
What's new in safety gloves and clothing
How can you stop accidents in advance
ACCIDENT and INJURY PREVENTION
How can machines be guarded
What is a "hard hat" area
Guards Guard!
Listen For Accidents
Meet Paula Bunyan
A Bomb Shelter Can Be Useful NOW
Safety's Basic At Basic, Inc.
Pulley Cracks Guard . . . Not Skull
Fight For Five
Highlights of National Safety Congress
Why is safety a "must" to management
Where is safety eyewear a "must"
How can you spark safety interest
When should safety shoes be worn
What should safety inspectors look for
What are hidden costs of injuries
How should you select respiratory devices

Wire brush wheel used to deburr parts has an added safety guard installed by the company to protect the worker against a part being picked up by the machine. Safety glasses are required equipment.

The installation of a shear-guard protects the worker from the blade or the part held down by leaving only a small opening several inches away from the dangerous moving parts of the equipment shown.

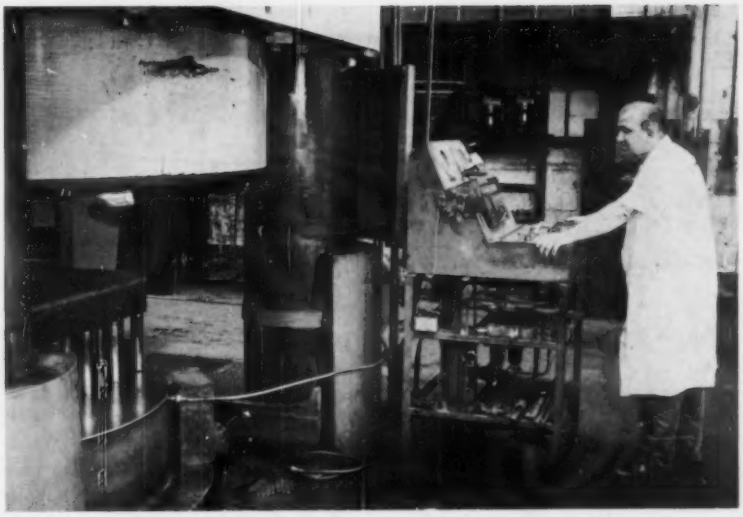
GUARDS GUARD!

Machine and equipment guards are the silent police that protect operators against their own misjudgments. The Baltimore Division of the Martin Company displays a wide variety of standard and custom-designed guarding devices as shown in the pictures.

Photos by Authenticated News.

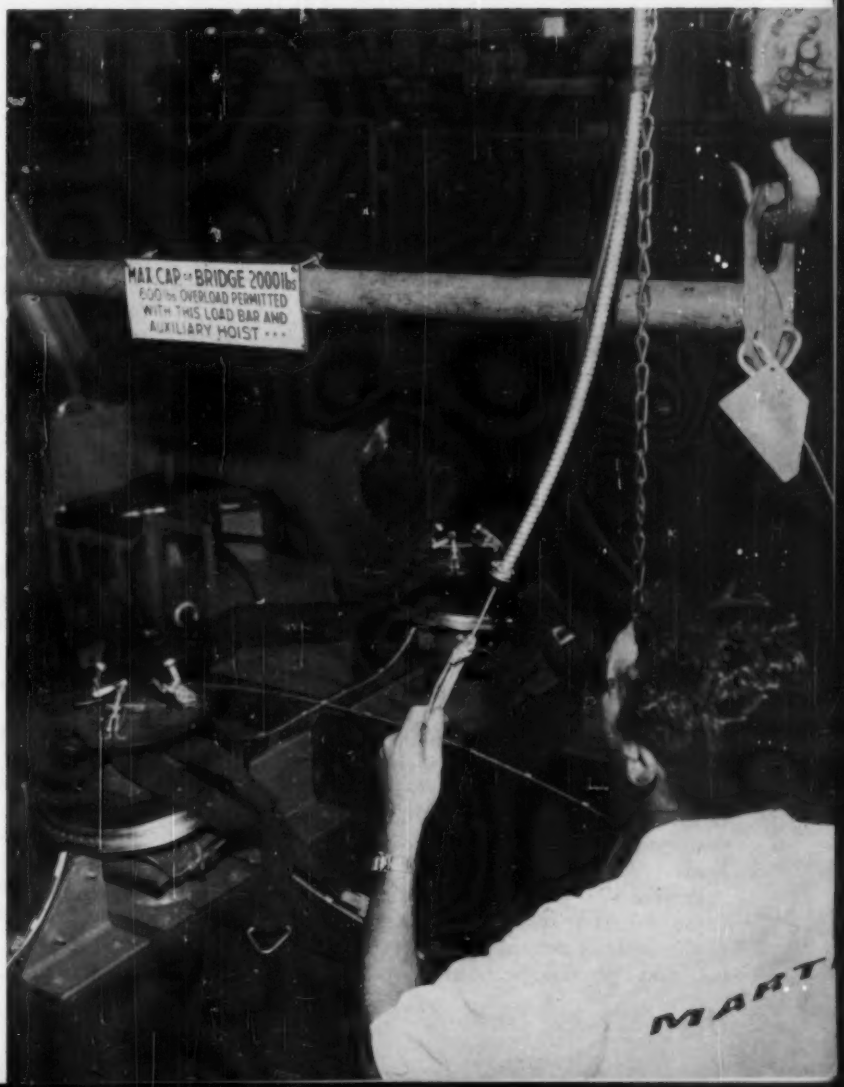
Special enclosure of glass and steel was built to provide protection for the worker testing parts under air pressure in a tank of water. Parts, primarily tubular sections, are tested for weaknesses.

Half clam shell stands open in front of this 6500-ton press as the operator prepares to lower the press. The clam shell swings closed around the column when the press reaches top of cycle.



Spring steel hold-down clip and a magnetic base on this punch press provide the worker with "hands off" safety while working with small parts. Worker also has both hands free to operate the press.

Worker operates hoist attached to a sling for lifting a large fixture. The cord in the man's left hand is an emergency cutoff, for use when a short circuit or other power failure makes normal controls useless.



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Machinery Guard SERIES

Other Articles: January and February

ACCIDENTS
Contagious Disease
Keep Out!

The above warning sign is not so absurd as it may seem at first glance. There is evidence that there are such things as "accident carriers" who infect others, just as there are small pox carriers. Also there are definite symptoms that we can listen for and use to fight the accident disease.

Physical safeguards are the nearest thing we have to vaccines and serums to overcome the accident infection. Because of these safeguards, less than 10 percent of the injuries in industry today result from physical causes or mechanical failures. Most accidents now are the result of human failure, usually as the result of emotional or mental difficulties.

Modern medicine recognizes that there is a psychological, emotional component in all diseases. Doctors and nurses must treat the psychological and emotional factors of illness along with the physical and physiological . . . and the accident disease is no different.

Control of the physical environment to prevent injuries is reaching the saturation point in companies and industries that have kept their safety programs up to date. Physical guarding, the elimination of physical hazards, the use of personal protective devices, the preparation of safe working practices, safe tools and equipment, good working conditions in plants, combined with matching aptitudes with jobs . . . all paid big divilends.

Present day gains are small because we have reached the point of diminishing returns from physical and physiological measures. Further improvement must be made in the areas of human motivation. Our annual toll of 14,300 occupational deaths and two million disabling injuries is far too great a price to pay for something we can prevent.

What are the symptoms of the accident disease? One important one is attitude. It is a symptom just as a sore throat, skin rash, or high temperature are symptoms of other diseases.

All of us react to what are called "authority figures." It is the authority figures that play a big part in creating safe attitudes in personnel. Our concepts of authority figures and our reactions to them start in the home and develop further in schools and in social contacts. In industry, the authority figures we meet on the job are the older employee, the boss, the doctor, the nurse, the safety man. The opinions and views of these authority figures have much to do

Case Histories of Accidents

1. THE CASE OF JIMMY:

A restaurant worker, Jimmy was normally a likeable, easy-going person on the quiet side. One morning he had violent disagreements with two of his fellow workers as soon as he started work. Then he cussed his supervisor when asked to do a routine job. Later, in the medical department because of a cold, he again exhibited bad humor to the receptionist and the nurse.

Returning to his job of grinding meat in an electric grinder, he used his finger instead of the spatula to clean the ground meat from the endplate. His finger slipped through a hole in the endplate and was amputated by the revolving knives.

Subsequent investigation revealed that a family problem involving money had reached a climax that morning before Jimmy had come to work. The matter had been under discussion for several days, but had come to a head that morning and resulted in a violent argument.

Could listening for accidents have prevented this injury? What preventive actions could be taken to offset temporary emotional situations that give rise to accidents?

2. THE CASE OF MARY:

During a 15-year period, Mary had had 18 accidents, with six of them resulting in serious disabling

with the creation of our own attitudes.

From the standpoint of the industrial safety attitude, studies of the relationship between the safety attitude of male supervisors and the actual accident experience of their employees over a five year period show that as the supervisor's safety attitude worsens, so does the lost time accident experience of his employees. Similarly, as the individual employee's safety attitude

(Continued on the next page)

LISTEN FOR ACCIDENTS . . . You're Dealing with PEOPLE

by **EARLE S. HANNAFORD, Ph.D.**
Safety Engineer
Long Lines Department
American Telephone & Telegraph Co.

and Their Symptoms

injuries. She had been given several different job assignments to try to suit the job to her needs. The machine she was currently operating was guarded, but the guard had to be removed from time to time to make necessary adjustments. The safety rules required that these adjustments be made only by the supervisor and that she was prohibited from removing the guard.

She had seen the adjustments performed many times, so when the supervisor was called away for a short period and an adjustment was needed, she secured the key from the supervisor's desk, removed the guard, and, in her hurry, failed to replace it. Of course, a few minutes later she had lost her hand in an accident.

This case illustrates a long term problem, stemming from a continuing poor attitude situation. How can we attack this type of problem by listening for accidents?

3. THE CASE OF BILL:

This third case is an example of off-duty injuries, which ultimately have the same results as those on the job.

Bill, in a self-supervising job, had been driving a company car for 28 years with no personal-injury accidents and only one minor vehicle accident. The company car had safety belts and he used them.

(Continued on the next page)

Listen for Accidents

(from page 13)

worsens, so does his number of injuries.

If we are to prevent injuries, we must detect them in the near-miss accident stage, for two thirds of industrial injuries happen to people who have never had an accident before. Studies of workers who have had one lost time injury show that they had known how to work safely but that *knowing was not enough.* Something more was needed to convert the safety potential into safety action. This *something more* could have been supplied in a few words from an authority or prestige figure such as line supervisor or safety man.

Industrial safety attitudes of both supervisors and employees are symptoms to watch out for when listening for accidents. Typical things to listen for are illustrated in the three accompanying case histories. These cases show *why* we must listen for accidents.

Following are some typical symptoms of accidents in the making . . . symptoms we should be listening for. Many of them are things we don't usually think of as symptoms of accidents in the making:

1. Errors in performance of work.

2. Changes in everyday behavior and manners.

3. Changes in simple habits of a routine nature.

4. Near accidents.

5. Poor employee and supervisory safety attitudes. (These can be measured with industrial safety attitude scales.)

6. Safety program "fatigue."

Not all of these are things that the safety man can watch for by himself. Many of them must be uncovered by the line supervisor on the job while the job is being done.

Employee Accident Symptoms

A more complete list of employee accident symptoms for which the line supervisor can watch would include such things as:

Resents and rebels against authority.

Inability to concentrate.

Lack of ability to perceive significance of instructions.

Always talking when he should be listening.

Violations of safe working practices.

Unable to face up to problems and take responsibility for his actions.

Can't seem to accept and play the role assigned him on the job.

Doesn't respond well to training.

A sulky, surly or self-pitying attitude.

Temper tantrums on one hand and apathy on the other.

When these types of behavior are observed, it means there is a vulnerability for accidents and preventive measures are in order. It doesn't mean that an accident will be immediate or inevitable. But ignoring these symptoms and not "listening for accidents" means you are missing your opportunities to offset accidents in the incubation period.

Supervisor Accident Symptoms

There are also symptoms which indicate that a supervisor is asking for accidents in his group. Some of them are corollaries of the employee's symptoms just discussed.

Failure to enforce and maintain firm, understanding discipline.

Not playing the role his position, responsibility and authority as a supervisor demands of him.

Failure to observe and correct violations of safe working practices.

Not facing up to problems.

Lack of adequate training of employees.

Poor supervisory control and failure to make prompt decisions followed by appropriate action.

No sense of humor to drain off tension.

Unwillingness to "listen understandingly" while employees talk out their problems.

Failure to build and maintain good safety attitudes.

Setting poor or wrong examples.

In the past we haven't always seen these things in their true significance in terms of their accident potential. Let's get the "safety mileage" out of them in the future!

When an accident-potential symptom has been discovered, what can be done? Here are the recommendations made by a panel of leading psychiatrists, psychologists, executives and safety engineers at the President's Conference on Occupational Safety. These are things we must do if we are going to listen for accidents and be in a position to do something to prevent them.

1. In selecting the right job for a person, consider his capacity for maintaining his psychological bal-

(Continued on page 16)

Case History of Accidents and Their Symptoms

(from page 13)

When Bill bought a new 275 H.P. car of his own, he also had safety belts installed. It was known that he occasionally liked to speed in his own car. One night he took the car out alone to try it out. Apparently he was going well over 100 miles per hour when he failed to make a curve. No seat belt in the world could have held him at that speed (since they are designed for impact at 50–60 miles per hour) and he was killed when thrown from the car.

Bill was the type of person who worked safely on the job, but off duty it was another story. How could listening for accidents have protected Bill from himself?

MEET PAULA BUNYAN

Since the start of a modern safety program in 1946, the U. S. Forest Service has achieved a steadily improving safety record. With large forest fires in the last two years the fine record was dented a bit. Now to put new life in an already successful program, the U.S.F.S. has adopted as its personality symbol "Paula Bunyan," supposed daughter of the renowned and mythical Paul Bunyan. To draw even more attention to safety, a very *real*, attractive Forest Service secretary often plays the role of Paula.

Achieving the impressive Forest Service safety record was no easy task as its men and women practice multiple-use management on 181 million acres scattered through 46 states and Puerto Rico—doing such work as forest fire fighting, road and trail construction, timber cruising, soil stabilization, range management, campground construction and maintenance, mountain rescue, snow surveys, wildlife habitat improvement, and research with newly developed processes, and chemicals.

Its people travel and work on foot, in airplanes, in helicopters, on horseback, on skis and snowshoes, in boats, and in cars and trucks. Much of this work is done in rugged terrain, often under adverse weather and fire conditions. The safety problem is further complicated by ticks, poisonous snakes, chiggers, and poison oaks and ivies.

To do this work, it takes about 15,000 people year round, plus another 15,000 during the peak summer months. During bad forest fire years, thousands more are hired to quell the flames. At one time this summer there were 25,000 fire fighters on the fire line.

The last two years have seen an upturn in the injury rate, largely due to the hazards presented by an exceptional scourge of forest fires.

Paula, the new symbol, is presented as the *"Guardian of Safety."*

(Continued on the next page)

Paula Bunyan, in relaxed mood, holds one of her safety accessories—the always essential safety hard-hat.

Personality Safety Symbol Adopted By Forest Service In Stepped-Up Safety Drive

Material prepared for Best's Safety Publications by the Industrial Safety Equipment Association Inc., 420 Lexington Avenue, New York 17, N. Y.

Technical data provided by Mr. Seth Jackson, Chief, Branch of Safety and Employee Relations, U. S. Forest Service. And Mr. Fred Heinrich, Safety Director, U.S.F.S.

The smokejumper as he used to look. Jack Heintzelman, former smokejumper, is now Forest Service safety officer.

Bill Carver, Montana smokejumper foreman, is shown here dressed in a complete modern-day smokejumper outfit.

As the story goes, she is the daughter of Paul Bunyan, the legendary, swashbuckling, and sometimes unsafe north woods hero. Being a woman, Paula knew how to get her message across to her father and converted him to a safety-conscious individual without impairing his tremendous production. Paula has a **"SURE way to SAFETY."** Her SURE formula comes in four parts:

Size up the situation.
Use your safety instructions.
Remember to protect fellow workers and forest users.
Establish a margin for safety.

Paula has appeared in person (She's Ruth Ann Shenk of the Forest Service) at the President's Conference on Occupational Safety this year. There, she and her assistant, "Paula's Helper" (Inez Buchanan, on the Staff of the President's Committee on Employment of the Physically Handicapped) were introduced as safety symbols by Smokey the Bear, the great forest fire prevention symbol. The girls circulated through the group distributing "Safety for Sure" cards. The Paula promotion received an enthusiastic reception.

To keep the "Paula" theme rolling, her picture appears on many promotional items put out in the interest of Forest Service safety.

Promoting a Personality of Safety

Much of the Forest Service safety program emphasizes job training, leadership, first aid training, driver training, incentives and awards.

The Forest Service plans to feature Paula on both the national and local levels as a safety symbol—with local branches choosing their own Paulas to promote safety at first hand in their individual areas. Plans have been made for the lumbering industry to adopt their own Paula to represent safety for its groups.

Although 1959 and 1960 were bad forest fire years, many fine safety performances were recorded. In California, 17,942 airplane flights, many of them hazardous—there were no fatalities—no injuries. Again, in California, 290,227 man-hours on tough fires in the Eldorado National Forest with only 3 disabling injuries, of which two were minor. In Oregon, 26,980 man-hours on the Aspen Flat fire—no disabling injuries. And, in the northeast, two ranger districts, New Castle and Williamsburg, with no lost time accidents since their inception in 1935.

Hazardous Work Shows High Safety Rating

It is often true that the more hazardous the job, the higher the safety record maintained. When people know they are in danger, they become more alert to safety precautions.

Take the job of the smokejumper, for example. These men—equipped with heavy canvas suits, iron masks, helmets, and parachutes back and front—have made 18,491 jumps to 5,246 forest fires since 1940, and there have been no fatalities in the jumping process. On the ground they work as regular first attack fire fighters, and their record is excellent.

The Forest Service maintains rigid safety precautions for these men. But the precautions are no more rigid than those outlined in the Health and Safety Code for all Forest Service employees.

The difference, in many cases, is that an employee in a low-hazard job may become lax about safety observances. He may feel that he doesn't need to be on the alert for possible danger—and therefore may be the needless victim of an accident that ought never to have happened.

Pictures by courtesy of U. S. Forest Service.

Listen for Accidents
(from page 14)

ance under the stress of that particular job.

The Significance of Stress in Accident Involvement: It is not the stress itself but the manner in which the individual responds to stress that tends to cause accident involvement. Capacity to cope with stress varies in the same individual from day to day. Accidents are frequently symptoms of personality defects and often serve a purpose in solving some particular problem, destructive though the solution may be. Management and safety personnel should be so informed that they may deal with the causes and not only with the symptoms.

2. Workers should be given an opportunity to verbalize their feelings and tensions in order to reduce their accident potential.

Controlled discussion in groups with a properly trained supervisor can reduce accident potential and has excellent therapeutic value.

3. Safety programs in industry must be fair and consistent and continuous in their application and administration.

A continuous, firm attitude, however severe it appears at the time, is better than a vacillating, inconsistent attitude. Inconsistency in the application of safety on the part of management can only lead to worker anxiety and doubt.

4. Industry must realize that the core of our personality structure is formed in our early home life.

5. Safe working patterns will be strengthened in the breadwinner if the family is encouraged to participate in safety award functions.

6. There should be no variation from the fact that safety responsibility is a unitary responsibility of the entire line management, and individual management people cannot delegate it.

7. Future training of professional safety people and line management must include systematic study of motivation and recognize the complexity of the forces influencing behavior. Among other things, this training should equip them for "listening for accidents" by spotting the indicators of potential accidents, such as errors in performance, change in everyday manner, changes in simple habits, and near accidents. If their possible significance is recognized, preventive action can be taken in time.

We have reached the point of diminishing returns from physical and physiological safety methods. We must go to the individual himself and study his behavior and motivations. The methods, outlined above, that have not been fully used up to this time must be explored and applied.

From an address presented at the September 1961 meeting of the Industrial Accident Prevention Associations of Ontario.

View of shelter command post, showing communications equipment and tape recorders for automatic message monitoring.

A Bomb Shelter CAN be Useful NOW

Planning a blast and fallout protection area for your plant? It need not be completely unused space. Try integrating it into your present or future expansion program for use on a part-time basis as a plant cafeteria, recreation room, or a meeting hall.

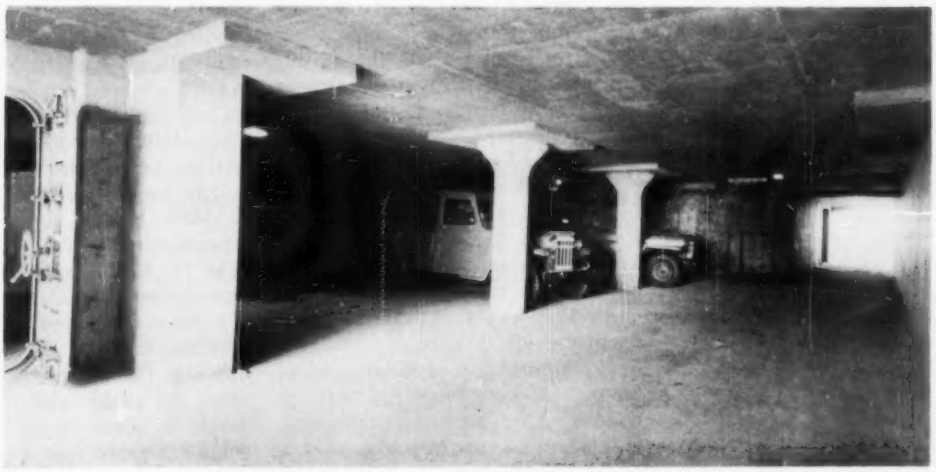
Spurred by growing international tensions, more and more industrial concerns are now directing their attention to the problem of providing protection for their employees against the hazards of nuclear blast and radioactive fallout. Few companies, however, have yet built the specially-designed underground facilities which are thought essential for this protection. Rohm & Haas, Philadelphia plastics and chemicals manufacturer, is an exception. The company completed its first personnel shelter in 1956, at its Bristol, Pennsylvania, plant. Since then shelters have also been constructed at plants in Bridesburg (Philadelphia), Knoxville, Tenn., and Houston, Texas. At each plant, the shelters are designed to offer protection against blast, radiation, and the immediate after-effects of a nuclear blast. The facilities are designed to accommodate all of the employees who will be in the plant on any one shift, for as long as two weeks, if necessary.

Double Use

Constructed of steel reinforced concrete, the underground shelters have been designed to conform to the standards of the Federal Civil Defense Administration, and are

(Continued on page 21)

Protected vehicle parking area inside the entrance ramp. Vehicles seen are: command car, rescue truck, fire trailer.



picture at right
GUARD FABRICATORS INSPECT NEWLY INSTALLED PANEL GUARD UNDER DIRECTION OF SAFETY DIRECTOR JIBILIAN.

SAFETY'S BASIC . . .

One of the world's largest facilities for producing granular refractories, the Maple Grove, Ohio Works of Basic, Incorporated, processes more than 2 million tons of ore annually. This plant employs 500 people and covers more than 300 acres. Located in almost the exact center of steelmaking America, Maple Grove supplies vital basic grain refractories for the construction and maintenance of open hearth and electric steelmaking furnaces. The company is also a leading producer of tar-bonded brick and ramming mixes for the new oxygen furnaces.

At Maple Grove, safety is no part-time job. With a variety of heavy mining and processing operations, safety cannot be left to chance. A full-time safety director, a full-time safety inspector and a full-time registered nurse are employed. Here are some of the many activities which keep this facility "Basically Safe":

A plant safety committee, comprised of a supervisor from each department, meets once a month and discusses anything pertaining to safety. Special emphasis is placed on accidents and near accidents. The safety director keeps minutes of the meeting and all recommendations are submitted to top management. In turn, top management prescribes the "When, How and Who" to take care of the various recommendations.

A plant inspection committee, in addition to the safety committee, consists of five supervisors who inspect the plant each month. The length of duty on the inspection committee runs four months and it

by **ARTHUR JIBILIAN**
Safety Director
Maple Grove Ohio Works
Basic, Incorporated

Safety Director Jibilian sells a pair of safety shoes. Company conducts a below cost safety shoe sale once a year.

Pictured here are members of a company first aid class learning to bandage "patient" and place him on stretcher.

. . . AT BASIC, INC.

is set up so that one man is replaced each month, thereby insuring a constant flow of new blood. The safety director accompanies the inspection committee and sends a report of the findings to the works manager, together with a copy to the head of the department inspected. Since a foreman or department head accompanies the inspecting team, the unsafe condition may even be remedied before the report is read by the works manager.

Personnel protective equipment, such as eye protection, hard hats, ear plugs, and respirators is furnished to employes free of charge. Safety shoes are stocked and may be purchased at cost through the payroll deduction plan. In order to stimulate the wearing of safety shoes, the company has a sale once a year. At that time, safety shoes may be purchased at three dollars below cost, the company paying the difference.

Machine guarding is handled by a small, separate shop with a group leader and a millwright whose main job is the elimination of physical hazards. These men repair and build guards, railings and stairways. Since they specialize in this kind of fabrication, their work is exceptionally good.

First aid classes are held at least once a year. This is a formal two-hours-a-day course for one week. It is taken on company time and is taught by a member of the Ohio Division of Mines. In one week of concentrated effort, we make pretty good first-aiders out of 40 men. Upon completion of the course, a dinner program is ar-

Two brothers were saved from serious injury by wearing hard hats. Here they proudly display Turtle Club certificates.

Fire brigade teams hold monthly practice sessions. Here a flammable liquid fire is extinguished in demonstration.

official *First Aid Manual* of the Bureau of Mines.

Foremen training plays a key role in safety at Maple Grove. We utilize the services of the Division of Safety and Hygiene, including a formal "Safety Seminar." This is a two-hours-a-day course, once a week, for 10 weeks. Some of the subjects covered are:

The Foremen's Responsibility
Safety and the Foreman
Communications
Accident Investigation
Good Housekeeping
Personnel Protective Equipment
Safety Rules
Workmen's Compensation
Cost of Accidents
Machine Guarding.

By courtesy of Industrial Commission of Ohio's Monitor.

Electricity Vital To High-Hazard Plants

The critical role of electrical systems in government plants manufacturing poison gas and other toxic material was emphasized at the Pacific General Meeting of the American Institute of Electrical Engineers. The meeting also was told that there is need for an "Institute Technical Group for plant electrical engineering" to "provide a more useful and comprehensive medium for dissemination of information and exchange of ideas" to "stimulate greater interest . . . on the part of plant electrical engineers."

These subjects were discussed by David Kamaroff, U. S. Army Chemical Corps, Army Chemical Center, Maryland, in a paper presented at a symposium on industrial and commercial power.

Electrical distribution systems in the government's five Chemical Corps installations consist of 18 prime substations and more than 600 miles of subtransmission and distribution lines, Mr. Kamaroff said. Electric power is supplied by public utilities and because of the nature of the chemical plants, the plant electrical engineers must take extraordinary precautions to avoid interruptions of power supply, faults and lack of capacity when needed, he said.

Foremost among the "peculiar" electrical demands "is an unusual need for continuity of service to laboratories and plants where toxic materials are handled." Such plants are completely airconditioned, often windowless and are maintained at a slightly negative pressure with respect to ambient atmosphere "so that air will tend to flow from non-contaminated areas. Interruptions to electric service contribute to hazards resulting from equalization of air pressures, loss of ventilating air and disabling of controls."

A recent study of program losses due to power outages at one research and development plant over a 10-year period "indicated a direct relationship between duration of outage and magnitude" of losses.

Emergency generators, equipped with automatic starting and transfer devices and located near the low voltage distributing centers of such plants "are the only practicable solution, but each generator must be economically justified" and intended to supply only critical loads.

"Another peculiarlity" of toxic laboratories and plants is the high electric power load, largely due to air conditioning based on 100 percent make-up air and as many as 15 air changes per hour.

Interior wiring in biological plants poses special problems, as decontamination wash down requires that wiring, fixtures and devices must be "vaportight." Contamination and corrosion, and the possibility of accidental spillage and leakage, present problems.

"Finally, whatever goes into these plants must be decontaminated before it comes out."

Bomb Shelters
(from page 17)

built to withstand the blast of a 20 megaton H-bomb at a five-mile distance. The installations at Bristol and Bridesburg, which must take care of approximately 1500 people at each location, are intended for use only in an actual emergency. At Knoxville and Houston, where the number of workers present in each plant on any one shift is less than four hundred, the facilities serve a dual purpose: they are in daily use as company cafeterias. At all four locations, the food which is stockpiled in the shelters is withdrawn at regular intervals and used in the company cafeterias so that it can be replaced with fresh supplies.

Each shelter is designed to take care of the essential needs of the occupants for the possible two-week period without help from any outside services. Water is obtained from wells which are located within the shelters—or, at some locations, from outside wells connected by underground piping. Generators, driven by gasoline motors, can provide light and power for the entire installation. Forced ventilation and a filtering system insure an air supply that is free of fall-out or chemical contamination. Sanitary facilities that are not dependent on the regular plant system have been installed. A communications center has been established which has short wave sending and receiving equipment, in addition to broadcast receivers and regular telephone connections. The shelters are even equipped with books and games—in anticipation of the need to keep the people occupied during the time of the emergency.

Although the shelter in each plant is different, there are basic similarities at all four locations. The installation at Bristol is described here in detail as typical of the design which Civil Defense authorities consider essential in an industrial personnel shelter.

Basic Design

The overhead protection in the Bristol shelter consists of forty inches of radiation-resistant material—two feet of earth and sixteen inches of reinforced concerte. The roof is capable of sustaining loads of 2400 pounds per square foot and negative loads of at least 1000 pounds per square foot (to protect against the effect of blast suction).

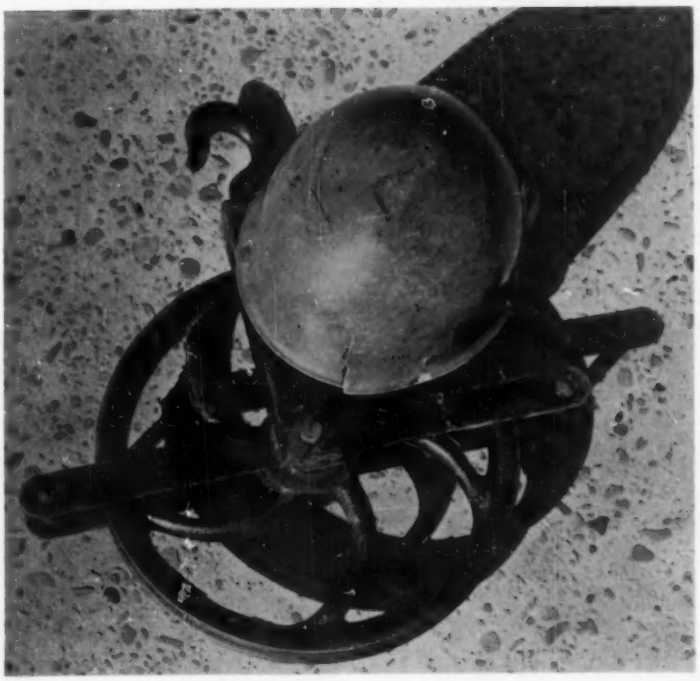
Equipment which is stockpiled in the shelter includes first aid supplies, tools, emergency clothing and an assortment of other supplies. An emergency entrance is provided through which late comers—workers who remained after the alert to shut down the plant, for example—may be admitted. Those coming in at this emergency entrance pass through a shower-equipped air-lock, leaving their clothing—which would probably be contaminated with radioactive fall-out—on the outside. Emergency clothing is then issued from the supply in the first aid room.

Ventilation Problems

One of the problems in a shelter operation of this kind is the dissipation of heat. It is estimated that each person will generate about

(Continued on the next page)

Another Injury Checked



Pulley Cracks Guard . . . Not Skull

An employee at an Eastern chemical plant discovered he was really "using his head" when he followed company safety rules for wearing a protective helmet on the job. He escaped serious injury when his safety hard hat took the full force of a 15-lb. steel wheel pulley falling 39 ft. from a scaffold post. The 15-lb. object struck the hat at a speed of 34 miles an hour, more than enough force to kill an unprotected worker. The laminated plastic hat was split in absorbing the tremendous impact, but the employee suffered only a minor injury and was soon back on the job.

Picture from Mine Safety Appliances Co.

A Salute to

A SAFETY IDEA

An effective safety program is being conducted at the Army Ordnance Corps' Picatinny Arsenal, aimed at preserving one of the most valuable assets to a skilled worker —his fingers.

The program was initiated because of the high rate of accidents involving injuries to the fingers and hands since the first of the year. By the end of June, employees in the Arsenal's Inert Components Branch had suffered 28 hand and finger injuries, representing 75 percent of the section's total injuries. The Inert Components Branch manufactures metal parts and components used in Picatinny Arsenal's research and engineering mission on Ordnance munitions and weapons.

Alarmed at the high accident rate, Arsenal safety experts initiated a crash program in an effort to eliminate such injuries.

Appropriately, the campaign was dubbed *"Fight for Five."*

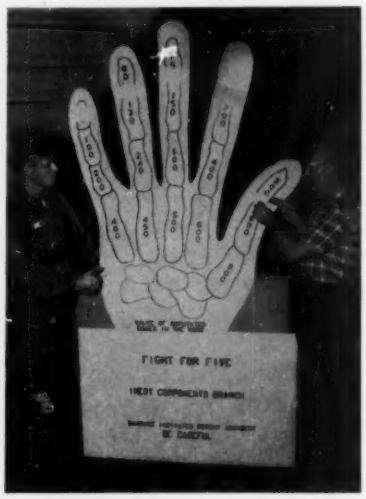
The campaign was launched early in July with a mass safety meeting of all supervisors and employees during which they received an orientation stressing the importance of improving safety in this area. They also were given pamphlets asking their cooperation and itemizing the branch's disenheartening safety record.

A special committee was appointed to make daily, unannounced inspections of the work areas, with full authority to make immediate on-the-spot corrections of all existing safety hazards to hands and fingers.

The men were issued premium-free accident insurance "policies" which pay off in "prosperity and health" for all persons who comply with specific safety regulations such as wearing protective equipment, following safety procedures and paying strict attention to the job at hand.

To assure that safety remained foremost in the workers' minds, gummed labels were affixed to each work order, job order and item of correspondence disseminated by the branch. The labels pictured an uninjured hand and the campaign slogan "Fight for Five."

The most significant and impressive feature of the campaign was the use of a huge eight-foot-high hand set up where it could be seen by all employees. Each time a



worker is involved in an accident causing injury to the hand or fingers, a bandage is wrapped around the injured portion of the mock-up hand.

Each part of the hand is marked with the approximate number of days work the average employee would lose if he were involved in an accident causing the loss of that part.

In June, the month before the campaign was launched, employees were involved in 35 accidents, 28 of which were hand and finger accidents. At the end of the second month of the campaign only eight accidents were recorded, five of which involved the hand.

Although the drive concentrated mainly on reducing hand and finger injuries, the over-all safety record was improved through greater employee safety consciousness and a determination to "Fight for Five."

U. S. Army Photograph.

Bomb Shelters
(from page 21)

three hundred B.T.U.'s hourly. Thus, at maximum capacity, the fifteen hundred occupants in the shelter would produce nearly half a million B.T.U.'s each hour. To dissipate this heat, the ventilation system circulates the shelter air over cooling coils through which the water from the well is pumped. This water is then used in cooling the generators and for sanitary purposes before it goes to waste. The location of the shelter is such that waste will flow by gravity to a land-locked lake on the property.

The basic intake for the shelter is through a fifty-foot high steel stack which is designed to be self-supporting, but which is also guyed for additional support. Air can also be admitted at ground level in an emergency. The use of the stack was felt desirable since the concentration of contaminants would be much lower at the fifty-foot level than at the ground. All air entering the shelter is filtered to remove fall-out particles and gaseous contaminants. The system provides for a normal air intake of 6.5 cubic feet per minute per person, but this can be reduced to only 1⅓ cufm per person if the contamination is so heavy that the filters would be quickly fouled at the higher input rate. A slight positive pressure is maintained within the shelter to prevent the entry of contaminated air through leakage at the air-lock doors.

The shelters are designed to protect life at a time of great disaster, and comfort cannot be a consideration at such a time. Sleeping facilities consist of bare plywood bunks —actually shelves—and can accommodate about 40 percent of the occupants at one time. Plywood benches provide sitting space for the remaining 60 percent of the occupants. Food is also planned on the basis of actual subsistence needs. It includes canned fruit, soups and stews, vitamin-reinforced multiple-purpose food, crackers, and instant tea and coffee. There are provisions for two meals a day at full occupancy during a fourteen-day period.

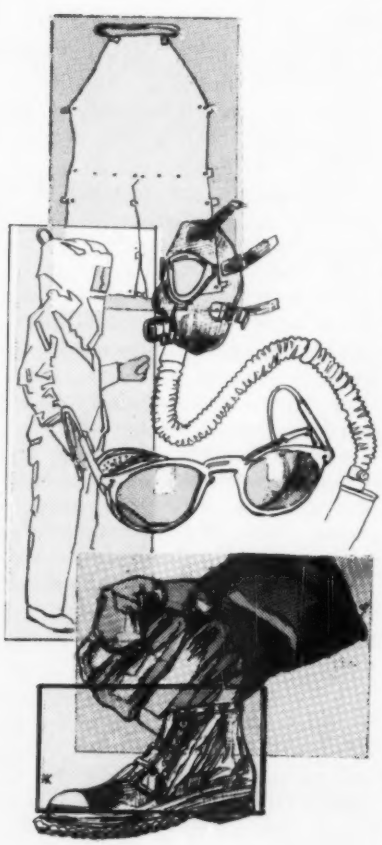
The personnel shelters which Rohm & Haas has provided at its plants represent a far-sighted

(Continued on page 28)

Highlights of National Safety Congress

Ways and means of reducing America's accident toll, which last year brought death to 93,000 persons and disabling injuries to 9,400,000 more, were sought in Chicago the week of October 16–20 by more than 12,000 safety specialists from all parts of the country.

They were attending the 49th National Safety Congress and Exposition, annual convention of the National Safety Council, held in seven Loop hotels Monday through Friday.



The specialists took a hard look at all classes of accidents—industrial, home, public, farm, and traffic, the latter being the biggest killer of them all which claimed 38,200 lives in 1960. The National Safety Council estimates that accidents cost America 13 billion 600 million dollars in 1960.

More than 900 speakers took part in more than 300 sessions. The Congress was opened with a general meeting by Howard Pyle, president of the Council, as the principal speaker.

John F. Gordon, president and chief operating officer of General Motors Corporation, was the principal speaker at the annual banquet. He spoke on "Safeguarding Safety Progress."

Safety Show

Concurrently with the Congress, the annual Safety Exposition displayed the newest developments of products, equipment and services to prevent accidents and injuries. Manufacturers of industrial safety equipment offered for industry's inspection new types of safety eyewear; steel-toed shoes; gloves and protective clothing to safeguard the wearer against chemicals, fire, abrasion, radiation; safety signs and tags; machine guards; fire extinguishers and fire fighting equipment; first aid kits and supplies; emergency stretchers; resuscitation devices and respiratory protection equipment; hearing protectors; safety slings; safety designed ladders and scaffolds; dust and fume analyzers—a vast array of equipment to cut the high costs of accidents.

Following are highlights from some of the papers presented at the general and special-subject sessions of the Congress.

The country's safety specialists were told they must face the judgment of all accidental deaths of the future if they wait for better solutions to the complex safety problem instead of making full use of what is already known. Howard Pyle, president of the National Safety Council, made this admonition at the opening session.

"We will never know all the answers to anything as complex as the challenges with which we are faced in accident prevention," Pyle asserted. "But we certainly will deserve the stigma of failure and neglect if we are ever slow about acting with the full strength of what is already known.

"Time and further research must improve on our plans for the future, but in the meantime, if a single death or injury occurs simply because any of us is waiting for a more perfect answer, it would seem to be that we would deserve the most critical of judgments."

Accident prevention is essentially a citizen effort, Pyle told the safety specialists.

"People, organized and otherwise, doing something for their country that needs to be done . . . where the people live . . . where they work . . . and where they play," he said.

"As often as private initiative and local responsibility fails, or for any reason is bypassed or preempted, something extremely vital, without which a free society cannot live, dies," he asserted.

Our Responsibilities

Pyle reminded the delegates that they speak and act for the thousands of dedicated volunteers and the many official and private agencies and organizations that make up the safety movement in America.

"To the extent that we succeed, and we must not fail, we will not only stop accidents, but we will be able to stand up with the citizenship of this country as living, incontestable proof to the world that a free people is most of all a responsible people.

"Ours is important business and we have only begun to handle it

as well as we can and must," he concluded.

Six major weaknesses of safety supervision were outlined by D. W. C. MacBean, Accident Prevention Coordinator, MacMillan, Bloedel & Powell River, Ltd. in discussing the new horizons in supervisory training:

1. Inadequate analysis of job hazards.

2. Inadequate analysis of accident causes. (Failure to fix responsibilities honestly.)

3. Inability of some supervisors to accept responsibility for employees' safety.

4. Inability to communicate effectively.

5. Failure to measure performance of participating supervision.

6. Failure of employees to accept personal responsibility.

MacBean went on to indicate the corrective actions that could be taken in overcoming these supervisory deficiencies.

For skeptics who do not believe a fire can occur in a metal mine, G. G. McPhail, Inspector of Mine Rescue Training, Province of Ontario, pointed out that, "We have had in our Ontario metal mines 186 underground fires in the period from 1947 to 1960. Of these, 109 were electrical, 27 were caused by burning or welding operations, 20 from smoking, 10 due to spontaneous combustion of sulfides, 2 from overheated air receivers, 3 resulting from blasting, 3 spread down the shaft from the surface, 3 set for warmth, 6 by friction, 2 by diesel equipment, and one, believe it or not, by lightning."

The speaker described the training of mine rescue teams and the equipment used. In discussing the 186 underground fires, he noted that no lives were lost. Rescue teams were used in 33 of them, the others having been discovered early enough so that rescue operations were not necessary.

"One of the extra dividends from mine rescue training," said McPhail, "is that the thousand or more individual trainees become automatically fire hazard conscious, and whether they realize it or not, are continually on the lookout for conditions that could lead to an outbreak."

The Safety Aspects of Grounding Portable Tools was the subject discussed by E. J. Matousek, General Engineering, International Minerals & Chemicals Corp., Skokie, Ill. He outlined the essential steps for safe operation of portable 110-volt single-phase electrical equipment:

1. Use a grounded power system with adequate overcurrent protection for all feeders.

2. Maintain a good ground grid. (Either a properly installed conduit system, or a supplementary ground wire network.)

3. Use standard three-wire receptacles and make sure the ground wire is connected to the ground grid.

4. Use three-wire cords for portable tools and appliances.

5. Periodically check portable tools to be sure that your ground wire insurance is in force.

How can public utility safety departments get linemen to wear rubber glove and sleeves in time to prevent accidents? What method or procedure offers the fewer loopholes, the least chance of human error, and the greatest consistency of compliance? These were questions posed by L. C. Meyer, Electric System Specialist, Employers Mutuals of Wausau; and he had the answers ready.

The speaker indicated the different policies regarding rubber glove rules and emphasized his own conviction that the best solution is the use of "rubber gloves from the ground up" or "gloves from ground to ground."

"It is the most sure way," Meyer said, "of getting rubber gloves on the linemen's hands before he gets within reaching distance of energized equipment. Besides, it is far better to wear gloves and not need them than to need them and not have them."

Basil J. Lorenz, Manager of Safety, Northern Indiana Public Service Co., has had some second thoughts on the recently developed "aerial basket" that permits linemen to work bare-handed on energized conductors. He emphasized that he was not opposed to the use of aerial baskets, but did want to present some of the training or retraining problems associated with their use.

The very selling points that make the equipment so desirable in operations—mobility, ease of reaching elevated locations, insulation value, reduction of necessary protective equipment, reduction of necessary personnel to do a job—have a tendency to undermine the safe practices that have been developed for years. This shift in practice and in the employee's attitude which follows can have a detrimental effect on the entire safety program. The safety man must recognize this potential reaction and when the aerial basket makes its appearance in his company, be prepared to make a positive approach in the safe practices to be applied in the operation of the basket. He must prescribe what has to be followed instead of outlining what does not have to be followed.

Ralph J. Crosby, Assistant Vice President, Marsh & McLennan, Inc., concluded his remarks on *The Economics of Safety* with the following observations:

"The proper administration of a good Safety Program is not an inexpensive performance but the results that can be obtained make it an activity that is worthwhile from an economic point of view.

"The normal accident cost is probably inconsequential when compared with total sales volume, production costs or net worth of company. But the value of an Accident Prevention Program should be viewed in terms of its objective rather than the effect upon the normal cost. It should be looked at in the light of controlling the potential losses."

The high frequency of industrial skin diseases is undisputed, according to Dr. Paul Boswell, Senior Dermatologist, Provident Hospital, Chicago, who outlined the many causes and factors involved in industrial dermatitis and general preventive measures that can be in-

itiated. He listed the following basic precautions:

1. Cleanliness of working environment.

2. Personal cleanliness encouraged by shower baths; separate lockers for street clothing and work clothing.

3. Initial physical examination to make sure the applicant does not have any predisposing skin ailment.

4. Insistence that workers report all irritations of the skin, no matter how trivial, to the medical department.

5. The use of protective clothing where indicated, as well as the use of protective skin creams.

Speeding ambulances have caused death to more people than they have saved, Dr. Preston A. Wade, prominent orthopedic surgeon, told the National Safety Congress.

Wade, who was consulted in the treatment of President John F. Kennedy's back injury, said that ambulances should be made to travel at normal speeds and obey all traffic regulations. Speed is rarely necessary to save a life, Wade said. More often, a rough and rapid ride aggravates the injuries the patient has suffered.

Wade also noted that the special privileges granted ambulances have often been abused. In one large city ambulances were used to transport radio stars from one studio to another so that they would not have to be slowed up by usual traffic regulations, he said.

Swimming instructors are failing in their duty as long as they do not teach people to swim while heavily clothed. More than 80 percent of all people who lose their lives in the water are fully dressed at the time of the accident, said Professor Robert W. Buckley of the Department of Physical Education at the University of Washington, Seattle.

Most swimming instruction teaches students to disrobe and then catch air in their clothing so that trousers, in effect, become water wings. Only advanced swimmers can learn these techniques, said Buckley, and only a small percentage of swimmers ever become able to swim well enough to disrobe properly. Also, usually students are required to remove only a single layer of light clothing and shoes which do not lace above the ankles.

Buckley stated that even swimmers of very low proficiency can be taught to keep and splash air into their garments while wearing them in water, thereby using their clothing to keep them afloat. He disputed the commonly-held belief that clothing picks up weight in water, and drags one under.

He listed a number of advantages of keeping clothes on if one falls into deep water:

1. Clothing protects the body from the initial shock of hitting cold water. It allows the swimmer to adjust to the cold more gradually, and thus to regain his breath.

2. It offers support for the first critical moments, when panic is likely to strike.

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(For details, use Key # M-4 on card on page 69)

3. It protects the swimmer from prolonged exposure. Water trapped within several layers of clothing warms from body heat, and acts as an insulator against the outside cold. In tropical waters, clothing protects against sun, predatory marine life, and rocks and reefs.

4. Remaining dressed eliminates the danger of becoming entangled in the clothes. Clothing can be inflated in much less time than it takes to disrobe.

5. Inflation can be taught more easily and in less time than disrobing.

Buckley described methods of "splashing" air into the shirt or jacket, so that it becomes trapped over the upper back and shoulders, and into the trousers, where it is retained by bending the knees to keep the feet under water.

He emphasized that such techniques must be kept simple, as poor swimmers need methods requiring little skill. A good swimmer, he pointed out, can usually survive his mistakes.

The world's first nuclear powered merchant ship will be one of the safest vessels afloat. The craft is the Nuclear Ship Savannah, now undergoing final tests and systems checkout in Camden, N. J. She will soon receive her first loading of nuclear fuel, according to Capt. Gaston R. DeGroote of the States Marine Lines, Inc., which will operate the ship under government contract.

DeGroote described the special safety features incorporated in the design of the new ship. He noted that some features were designed not only for the type of reactor used on the Savannah, but for the particular reactor. Other types and future models of the same pressurized water type may require completely different safeguards, he said.

The reactor compartment is approximately amidships and is the heart of the Savannah's propulsion system. It can take the ship 14 times around the world without refueling.

According to Capt. DeGroote, 2,400 tons of steel, lead, concrete and polyethelene shield the reactor power plant and its containment vessel from any possible damage. Under no circumstances will passengers or crew be exposed to dangerous, uncontrolled radiation, nor will operation of the ship adversely affect any environment in which it is located. The plant will be completely protected from any possible damage due to ship movements.

Instruments constantly monitor reactor performances and the operation of the pressurizer, pumps and other parts of the plant, and transmit signals to a main control panel and to the automatic safety and control systems.

The safety system is so designed that the reactor will immediately and automatically shut down if hazardous conditions develop. All control rods would be returned to their original position in the core to instantly stop the fission process. At the same time, visual and audible alarms would be set off.

"He does a fairly conscientious job of checking the safety belts."

There are two methods of automatic shut down, Capt. DeGroote said, depending on the type of emergency. These automatic processes override all control signals, whether automatic or manual.

Besides the special safety systems required by the nuclear power plant, the NS Savannah is equipped with a network of indicators, controllers and equipment to provide information and to control primary, secondary, auxiliary, propulsion, and ship services systems. Alarms are provided to indicate equipment or instrument conditions which would place the plant in an undesired operating condition.

The Federal Government may be forced to regulate automobile safety standards, smog control, driver licensing and automotive supplies standards, according to a paper prepared by Rep. Kenneth A. Roberts (D., Ala.) member of the Committee on Interstate and Foreign Commerce and chairman of the Subcommittee on Health and Safety. He warned that unless the individual states stop "dragging their feet" in establishing minimum safety standards, it may become necessary for the Federal Government to step in with legislation.

Noting that Americans spend about $87 per death due to heart disease for research and $360 per death on cancer research, while about $2.50 a year per death is spent on highway safety, Roberts said that more federal work should be done in this field. This would not infringe on state's rights, he said, as such research is too expensive to be handled entirely by state and private funds.

The Congressman said the Federal Government should also establish minimum safety standards for the motor vehicles it buys. He pointed out that in 1959, 50 federal civilian employees were killed and 3,912 were injured in motor vehicle accidents, with a cost to the government more than $4¼ million.

The standards set for federally-owned vehicles would filter down to the states and to the public, Roberts said, and would be incorporated in new automobiles.

Legislation may be necessary to bring about the installation of an inexpensive device to eliminate "blow-by gases" which account for 40 percent of automobile exhaust fumes which contribute to smog, according to the congressman.

He recommended that drivers in interstate commerce be required to hold permits from states which have permit laws in conformance with the Uniform Vehicle Code, and said that perhaps federal highway funds should be cut off from states which do not adopt the code.

Virtually everyone regards himself as an above-average driver, the National Safety Congress was told. Hugh L. Rusch, vice president of Opinion Research Corporation, said

that a study on traffic safety attitudes conducted by his firm for the Pure Oil Company and the ATA Foundation found that nine persons in 10 rate themselves above average in driving skills and in obeying traffic laws.

Moreover, all persons studied who had a traffic violation rated themselves above average on both counts.

In a related finding, seven out of 10 persons agreed that accident reports in newspapers are helpful in improving safety, but almost an equal number acknowledged they react "That can't happen to me" when they see such publicity.

So far as safety campaigns are concerned, Mr. Rusch said that the over-all findings "strongly suggest that straight safety reminders, such as 'You must drive safely,' are no longer very effective. But safety information linked with suggestions on how to improve driving skills—how to drive on icy roads, who has the right of way in traffic circles—do register and motivate drivers."

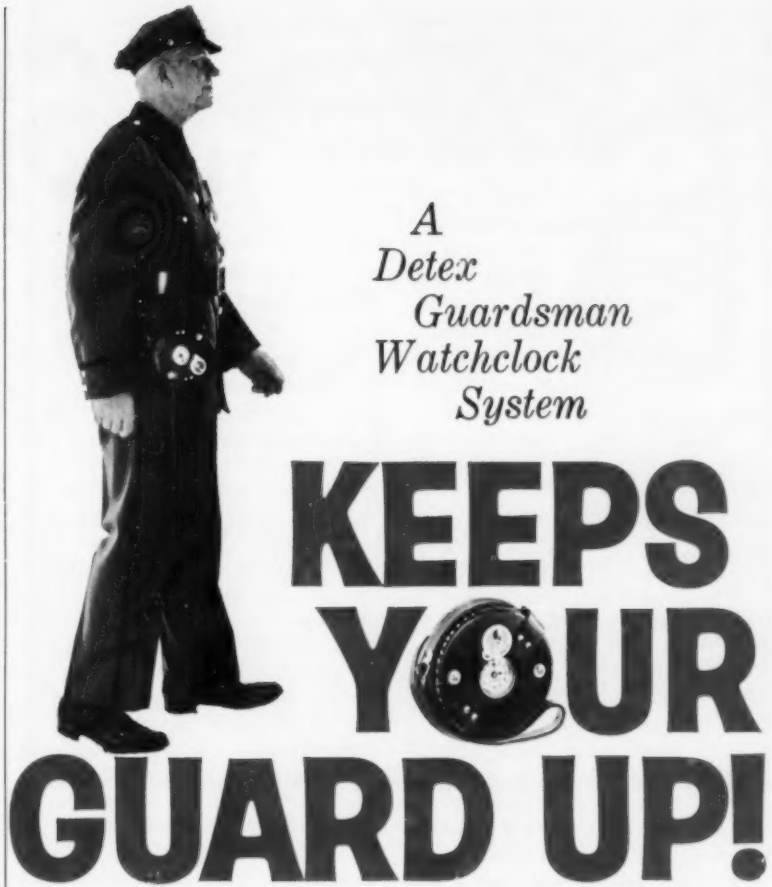
The same principle applies in dealing with industrial safety, he said. "People do not feel saturated with news advocating safety, provided such information is presented in an interesting way and related to their needs."

In the industrial field, Mr. Rusch reported on an ORC study that established an apparent link between safety and productivity. The survey, conducted in 9 companies, involved a high productivity and low productivity plant from each firm. Each pair of plants made the same products with similiar equipment. It was found that employees in the high productivity plants give their employers substantially more credit for safety practices than those in low productivity ones.

Several surveys Mr. Rusch discussed established a generally high safety rating by employees for management.

In one survey 82 percent of employees questioned said they could depend on top executives to make working conditions as safe as possible.

In another survey, 83 percent of employees questioned said their company is working very hard to improve safety and reduce lost-time accidents.



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(For details, use Key # M-5 on card on page 69)

No new driver should receive any type of license unless he has been specially trained to handle emergency situations, and even then he should be restricted from carrying passengers for a year. This two point program was presented by Alfred L. Moseley of the Harvard University Medical school. Moseley is chief investigator for the Research on Fatal Highway Collisions program of the school's Department of Legal Medicine.

The purpose of the embargo on passengers is to permit the new driver to gain experience with a minimum of danger to anyone else, Moseley explained. The only passenger the new driver would be permitted to have would be an instructor in advanced driving techniques.

Normal human physiological and psychological limitations cause many accidents of private airplanes

each year. Without knowing it until too late, a pilot can find himself flying blind in a cloud, according to two physicians. With less than 71,000 private aircraft in use, the death rates of private flying are extremely high when compared with those of commercial airlines and motor vehicles. In three of the past four years, 80 or more persons were killed in light plane crashes.

Dr. B. Dixon Holland, secretary of the Committee on Aviation and Space Medicine, American Medical Association, pointed out that because of the visual limitations of human eyes, a pilot cannot always avoid clouds, and that control of an aircraft under instrument conditions is impossible unless the pilot has had special training. This is due to the limitations of the senses, which, on the ground, make one aware of his position and state of motion.

Dr. Harold N. Brown, chairman of the Space Committee of the Flying Physicians Association, explained how pilots with limited training can enter clouds inadvertently, then, relying on their senses, find themselves in unusual positions and eventually exceed their planes' structural limits in their maneuvers.

Once inside a cloud, the use of the eyes in determining position and direction of motion is lost. All that is left to the pilot without instruments are the impressions of the balancing senses.

Bomb Shelter
(from page 22)

awareness on the part of the firm of the need to protect its employees and provide for the resumption of manufacturing operations as soon as possible after the emergency. Many of the products made by Rohm & Haas would be of critical importance to the country at a time of military crisis.

The shelters are already constructed, but the company continues to study the problem of personnel protection in the event of disaster, so that the provisions may be improved as new information in this field becomes available.

Pictures from Rohm & Haas.

THE SAFETY SHELF

Hazardous Chemicals

A completely revised version of the former table of common hazardous chemicals re-titled as "Hazardous Chemicals Data" has just been issued by the National Fire Protection Association. This informative pamphlet, which is widely referred to as a guide to good practice, discusses the hazardous properties of 78 chemicals and presents them in an easily read form. Besides adding the common synonyms for each chemical discussed, preparation of the new version has included a careful review of every item with all material being brought up to date and expanded.

The new revision was prepared by the NFPA Sectional Committee on Properties of Hazardous Chemicals under the chairmanship of Thomas E. Duke of the Fire Prevention and Engineering Bureau of Texas, and after approval by the parent committee, the Committee on Chemicals and Explosives, was adopted at the annual meeting of the National Fire Protection Association.

Copies of the revision (NFPA No. 49M, 54 pages, 75 cents) are available from the National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass.

New Standard On Automatic Lifts

Greater safety in the design of automotive lifts is provided for in a revised industry standard now under development, it has been announced by the Commodity Standards Division, Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

Recommended by the Automotive Lift Institute, the revised standard has been endorsed by interested manufacturers, distributors, and users. It covers the principle types of lifts currently produced, and describes methods of design and construction that provide full capacity and safe operation. The new standard will be published when sufficient additional endorsements are received from the trade, according to the Commodity Standards Division, which cooperates with industries that request its assistance in establishing standards for their products through trade acceptance.

The Recommended Revision of Commercial Standard CS142-58 (Automotive Lifts), now under consideration for trade acceptance as TS-5538, is available upon request from Commodity Standards Division, U. S. Department of Commerce, Washington 25, D. C.

Handbook On School Housekeeping

Planned as a practical guide on all phases of school housekeeping for administrators and custodians, a three-volume "Guide for Custodians and Administrators" has been written and published by Otto E. Mason, business manager of the Temple City Unified School District.

Based on Mason's experience as a school administrator and an instructor of custodial workshops for Los Angeles County Schools, Los Angeles State College, and the California School Employees' Association, the guide is intended for group instruction as well as on-the-job reference.

The first volume, of five chapters, deals with the planning, organization and supervision of custodial work. The second volume, consisting of six chapters, is concerned with work methods and techniques,

and the last volume is devoted to subjects related to custodial work in schools. The handbooks have been written for easy readability and are illustrated.

The guide, which has been reviewed by numerous leading authorities in custodial work and material supply, is available from the publisher at $4.00 for the three volumes. Individual volumes are $2.00, $1.50 and $1.50 each, respectively. The publisher's address is: Otto E. Mason, 5943 North Rosemead Blvd., Temple City, California. California residents must add 4% sales tax. A discount is offered for quantity purchases for school use.

Workers Worth Hiring

The new booklet, *Workers Worth Their Hire,* has just been published by the American Mutual Insurance Alliance for wide distribution to industry in cooperation with President Kennedy's Committee on Employment of the Physically Handicapped.

Its purpose is to correct misconceptions held by many as to the desirability of hiring physically handicapped workers. Among these are: Handicapped workers are more likely to have accidents. The employer's workmen's compensation insurance costs will rise if he hires them. Such workers are frequently absent from their jobs. The handicapped are not good prospects for long-term employment and are not promotable. Their production is not up to standard.

The booklet points out that physically handicapped persons, when properly placed, trained and supervised, work at least as safely as others. Workmen's compensation insurance costs depend upon the relative hazards of types of work and upon the employer's overall accident experience; physically handicapped workers have no more effect upon these factors than do other employees. Absenteeism among such workers is no greater, and often less, than among others. Many such workers have been with the same employers for many years, and frequently have been promoted. They produce at slightly higher rates than unimpaired workers under proper conditions.

Many insurance companies, long have been leaders in urging employment of the physically handicapped and in providing rehabilitation rather than mere financial compensation for injured workers.

Further details are available from Bureau of Information, American Mutual Insurance Alliance, 20 North Wacker Drive, Chicago, Ill.

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(For details, use Key # M-6 on card on page 69)

Shipboard Fires

"Practically every ship, of any nationality, built before World War II, is appallingly vulnerable to fire" says Frank Rushbrook, author of a new book, **Fire Aboard,** just published by Simmons-Boardman Publishing Corp.

Here's an astonishingly frank discussion of the problems of fire prevention and control in ships and port installations. To illustrate the nature of the problems, the author gives a series of critical accounts of a number of major recent disasters by fire to ships at sea, in ports, and to port and harbor installations. British regulations for the prevention and control of fire at sea are compared with the corresponding American rules. There are chapters on modern fire-fighting equipment in ships, fire-proofing of vessels in their design and construction, the protection of port installations against fire, training of ships' personnel in fire prevention and control, principles of fire-fighting in ships, and the need for international standardization of fire-fighting equipment and deck nomenclature.

Marine industry personnel, naval architects, ship-owners and builders, ships' officers, insurance companies, firemen, and port and harbor authorities, will all find in this challenging new volume a mine of information on the ever-present fire problem at sea and in port.

"Fire Aboard" by Frank Rushbrook. 540 pp. Fully illus. $12.00. Published by Simmons-Boardman Publishing Corp., 30 Church St., New York 7, N. Y.

ACHIEVEMENTS AND AWARDS

Employees at Goodyear Atomic Corporation in Portsmouth, Ohio have been cited by the Atomic Energy Commission for compiling five million man-hours without a single disabling accident in a 15-month period. The Goodyear Tire and Rubber Company subsidiary is operating contractor for the AEC's Portsmouth-area gaseous diffusion plant.

S. R. Sapirie, manager of AEC's Oak Ridge, Tenn., operations, said in a letter to general manager, G. H. Reynolds, that the Atomic Energy Commission "has always emphasized safe working practices and is extremely proud of its nationwide safety record. Each accomplishment, such as yours, adds to this record. We are most conscious of the individual effort necessary to maintain this outstanding record."

• • •

Disabling injuries in the gas industry dropped to a record low in the second quarter of 1961, according to a national survey by the American Gas Association. A sampling of 83 representative companies showed a 14.4 percent decrease. The frequency rate in the second quarter was 5.35 disabling injuries per million man-hours, compared with 6.25 a year earlier.

The severity rate of 444 days lost per million man-hours represented a drop of 16.1 percent from 529 days lost in the second quarter of 1960.

A.G.A. said another record safety year for the gas industry may be developing since the frequency rate for the first six months of 1961 is 15.5 percent lower than the 1960 annual frequency rate. The six-month severity rate showed a 21.5 percent decline from last year. In 1960 the gas industry improved its safety record for the thirteenth consecutive year.

A downward trend was reported also in motor vehicle accidents by the 69 companies which reported on this data. During the first six months of this year, 78 employees had disabling injuries. This is a 6 percent drop from the first half of 1960. The companies responding operate 19,555 vehicles and traveled more than 118 million miles during the first six months of 1961.

• • •

For the third time, a safety record without parallel in the construction industry—a full year without a disabling injury—has been set by Du Pont Construction Division men at 34 heavy building sites in 13 states. In early October, over 7,000 Du Pont employees had worked 12 consecutive safe months. In addition, about 4,000 employees of subcontractors on these sites, following the same safety practices prescribed for Du Pont employees, chalked up 10 consecutive months without any lost time due to an on-the-job accident.

For this period, the two groups worked a total of nearly 14 million safe exposure hours. Had they followed the accident frequency rate of the construction industry as a whole, upwards of 420 crippling injuries, or even deaths, might have been expected.

This marks the third time that Du Pont construction units scored a 12-month perfect safety record. In recognition of this achievement, specially designed safety citation medals will be awarded to all employees at ceremonies at each site.

• • •

The employees of two units of the Esso Research and Engineering Company in Linden were lauded recently for their outstanding safety records in the State-wide Safety Awards Program by Raymond F. Male, N. J. Commissioner of Labor and Industry. He spoke at ceremonies marking the presentation of both the Commissioner of Labor and Industry Award for Distinguished Achievement and the Bureau of Engineering and Safety Award of Merit to the Enjay Laboratories and Products Research Divisions.

"Safety," the Commissioner stressed, "pays dividends at least three ways. There is the avoidance of personnel tragedy when a worker is injured. The firm and its shareholders profit through reduced cost of production. The consumer benefits by paying a lower cost for the product."

The 118 employees of the Enjay Laboratories were honored for their accumulation of 560,000 man-hours of safe operation in a four-year period. Products Research, which employs 329, set a safety record of 2,199,550 man-hours in a 27-month period.

Both units are now eligible to qualify for the Governor's Safety Award, top honor in the Award Program which is co-sponsored by the Department of Labor and Industry and the N. J. State Industrial Safety Committee.

• • •

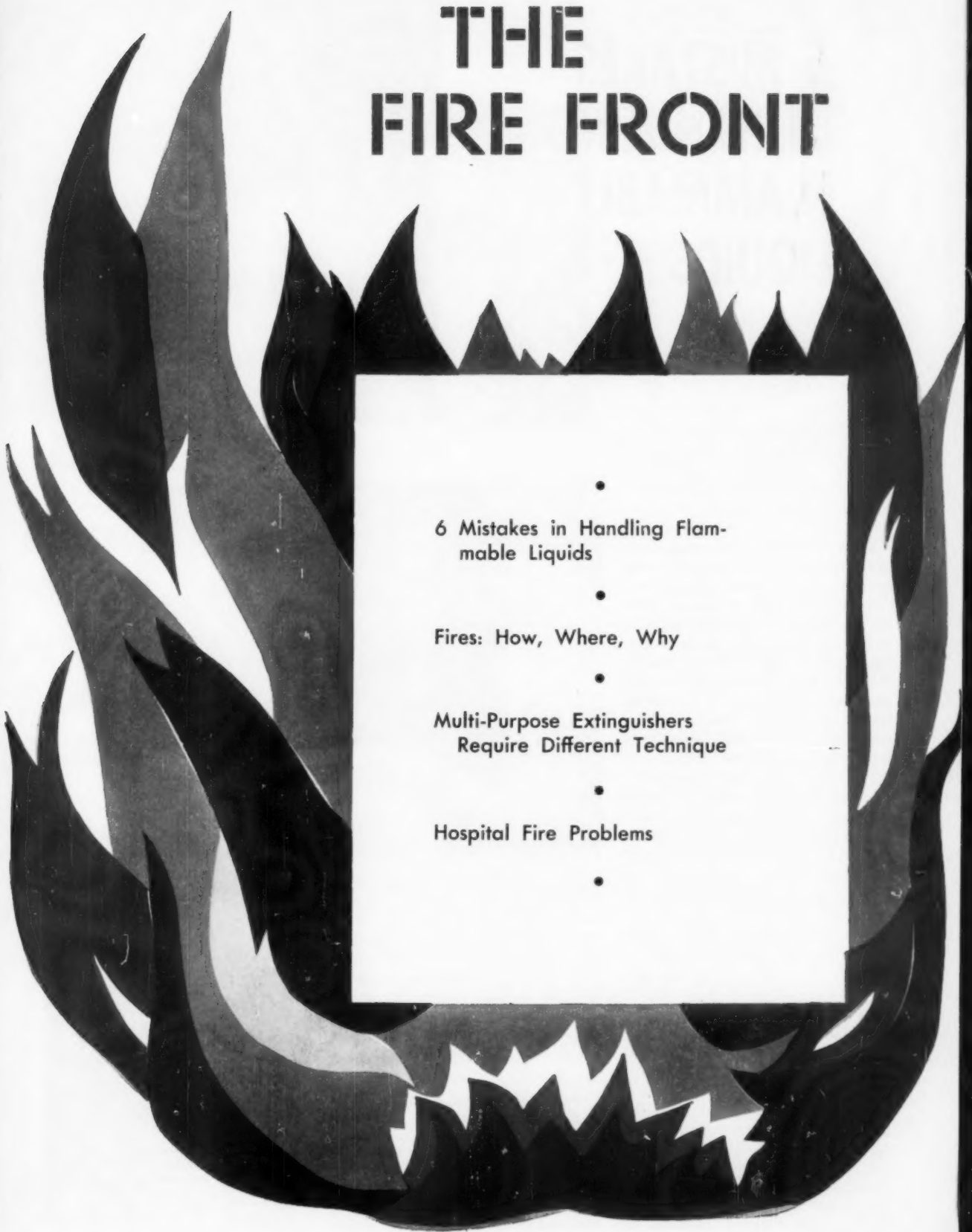
Central Hudson Gas & Electric Corporation, Poughkeepsie, N. Y., has been awarded the National Fleet Safety Contest Plaque presented annually by the National Safety Council and the American Gas Association.

The local utility's gas crews, operating 115 vehicles 1,160,000 miles between July 1, 1960 and June 30, 1961, earned first place in the large fleet division of the contest by having the lowest accident rate, 0.26 accidents per 100,000 miles driven, among all gas companies in that division.

• • •

Working a full year without a disabling injury has set a new all-time safety record for employees of the Lockheed-Georgia Company's swing shift. A total of approximately 2,000 employees have worked nearly three million man-hours without an accident causing anyone to lose time from the job.

THE FIRE FRONT



- 6 Mistakes in Handling Flammable Liquids
- Fires: How, Where, Why
- Multi-Purpose Extinguishers Require Different Technique
- Hospital Fire Problems

6 MISTAKES IN HANDLING FLAMMABLE LIQUIDS

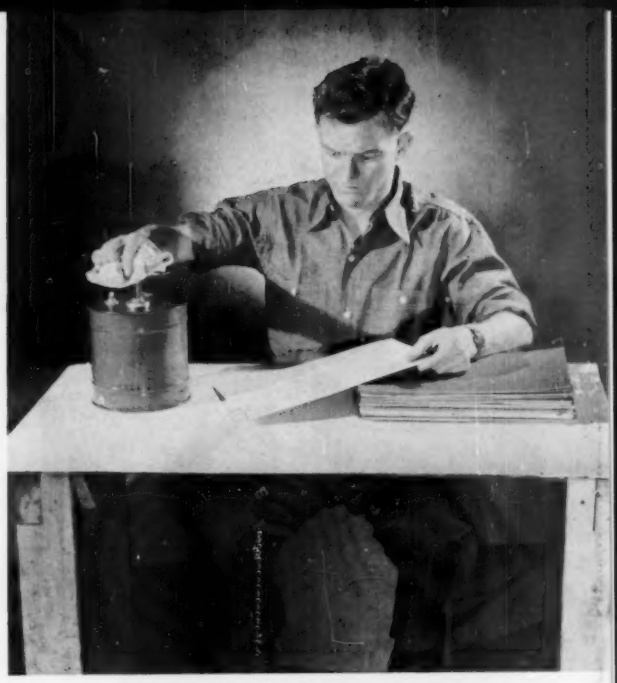


Fig. 1—Potential hazards must be respected at all times. Here a plunger facilitates fast, safe cleaning operations.

1. Lack of Proper Respect for Potential Hazards

High on any list of mistakes made in the handling of flammables is the careless, casual attitude frequently displayed by workers toward flammables warns The Protectoseal Co. Because "familiarity breeds contempt," many plant workers can (if they are not carefully instructed and supervised) treat flammables with less than the respect these valuable, but potentially dangerous materials deserve!

Directors of Safety know that workers are safer workers *if they have the proper knowledge of potential hazards* and correct attitude toward their jobs and the tools and equipment they work with. If every worker can be taught to respect the flammables he uses or comes into contact with, plant safety records would be much improved. But how do you successfully teach correct attitudes and respect?

Practical psychologists . . . and what Director of Safety doesn't have to be one? . . . recognize that one of the most powerful forces controlling human conduct is the **desire for self-preservation.** This factor is used in displaying warning posters and exhibits of the consequences arising from unsafe working practices. By actually demonstrating the dangers inherent in careless or improper handling of flammables, correct attitudes and respect could be developed very quickly.

Fig. 2—Use proper equipment. Metal hose of dispensing can prevents spills, keeps contact with small container.

Each Director of Safety or Plant Protection must work out an educational program best suited to his own plant and personnel. A rather delicate balance must be maintained between implanting unreasonable fear and proper respect, but the goal is well worth the effort.

2. Use of Wrong Type of Equipment

Protectoseal Flammables Engineers report that use of the wrong type of equipment is perhaps the most common mistake they find in the course of their work. Aside

Fig. 3—Dispensing equipment must be grounded at all times. Here, drum is grounded and self-closing faucet used.

Fig. 4—Be sure to label containers. Each of these space saving oval cans is labeled to prevent confusion.

6 STEPS TO SAFE HANDLING OF FLAMMABLE LIQUIDS

Fig. 5—Streamline transfer requirements. Here a safety can is efficiently used for transfer to an open container.

Fig. 6—Disposal of waste liquids need not be troublesome. Here, unused liquid is easily returned to the safety can.

from the obvious and easily detected error of using non-safe containers—open pails, plastic or glass jars, etc.—engineers report that incorrect equipment is most often used in the *dispensing* phase of flammables handling.

55 gallon drums, are often found with ordinary faucets which lack automatic shut-off features. Or, if they do, the faucets are not equipped with flame arresters to prevent propagation of fire from outside sources into the drum. Some solvents require special gasket materials such as Teflon. When gaskets are not made of the correct material, faucets develop leaks which cause hazards.

Another common example is using a safety storage container (without flexible dispensing hose) to fill vessels or tanks which have small receiving openings. This leads to spillage. Also, it is difficult to make metal-to-metal contact between the storage can and the smaller can or tank. Using the proper type of can equipped with a metal dispensing hose permits the transfer to be made without spilling a drop of liquid, while proper ground contact can be made by the hose. See Figure 2.

3. Failure to Ground Dispensing Equipment

In transferring flammable liquids, static charges are produced by the liquid flow. Unless proper grounding precautions are taken, a spark could cause an explosion or flash fire. See Figure 3.

Because static electricity is the "unseen hazard," workers often neglect making proper ground connections. In most cases, it is impossible to supervise each flammable transfer made in a plant, so the Safety Department must rely on education and instruction. Because it is less frequently done, it may be possible to assign responsibility for checking the grounding of newly received drums of flammables.

Good point to make: When the *drum* is grounded and actual metal-to-metal contact is made *between the drum and the container being filled,* the danger of a static spark touching off an explosion or fire is virtually eliminated.

4. Failure to Label Flammables Containers

Most safety authorities agree that painting flammables containers a distinctive color or according to a color code is not sufficient to alert and inform plant workers of the container's contents. Best practice is to clearly label containers with large, legible letters so that there is no question as to exactly what is in the container. Marking the container is no absolute safeguard against misuse of flammable or hazardous liquids, but prudence

dictates the wisdom of clearly labeling each container. See Figure 4.

To prevent confusion and accidents, many plants have a rule that, once a container is used for a particular liquid, no other liquid shall be contained in that can. While this may seem to be an arbitrary attitude, reflection will indicate the good sense of the rule.

5. Unnecessary Flammables Transfers

Everyone with a knowledge of the potential hazards involved in handling flammables will agree that each time they are handled, the chances of an accident increase. Yet, in many plants, flammable liquids are unnecessarily transferred from one container to another *because the proper container was not used in the first place.* See Figure 5.

Example: A worker withdraws Acetone from a drum into a one gallon safety can and carries it to his work station where he uses it to fill a Plunger Can. A fellow worker at the other end of the bench replenishes his supply can from the same drum and returns to his place. *One of these trips and transfers is unnecessary.* A larger supply can could have been used by all the workers at the bench, trips (and time) saved, and the hazard caused by repeated transfers eliminated.

By using the container that offers the most convenient and economical operation for the end-use or purpose intended, flammables handling can be made much safer. Factors to be taken into consideration in selecting the correct container are: quantity of solvent required, size of fill opening in the receiving vessel and the desired speed of dispensing.

6. Improper Liquid or Waste Disposal

"Why is it" a Director of Safety recently wrote, "that many workers who are careful and correct in their handling and use of flammables, are so careless when it comes to *disposing* of waste liquids?"

In discussing the same situation some years ago, someone ventured the guess that perhaps some people thought that after a flammable cleaning solvent had been used, it lost its strength (flammable properties) and could be disposed of in the same manner as water—by pouring it down a sink! See Figure 6.

As long as any trace of flammable liquid remains—no matter how long it has been used or exposed to the air—it is still capable of giving off explosive or ignitable vapors. A piece of cotton waste, used to wipe up a fraction or an ounce of flammable liquid, is a potential source of danger if it is not disposed of in the proper manner.

Pictures from the Protectoseal Co.

September Losses Down

Estimated fire losses in the United States during September amounted to $76,976,000, the National Board of Fire Underwriters reported. This loss represents a decrease of 5.9 percent under losses of $81,845,000 reported for September, 1960, and a decrease of 16 percent under losses of $91,663,000 for August of this year, according to Lewis A. Vincent, NBFU's general manager. Losses for the first nine months of 1961 now total $896,739,000, an increase of 8.2 percent from the first nine months of 1960, when they amounted to $828,51,000. These estimated losses include an allowance for uninsured and unreported losses.

Fires: How, Where, Why

More than $1,544,000,000 worth of property went up in smoke during 1960, the National Fire Protection Association estimated in its annual report. This is the first time in history that U. S. fire losses have reached and exceeded the $1.5 billion mark.

With the 11,350 Americans killed by fire—more than half of them in their own homes—reported earlier by the association, the year added up to the worst on record.

The unprecedented destruction of life and property occurred in almost 2,124,000 fires.

Principal causes of fire, according to the NFPA analysis, were **careless smoking, defective heating and cooking equipment, electrical defects, and mishandled flammable liquids.**

Fire destroyed or damaged more American homes than ever before, the NFPA report for 1960 showed, with a total of 563,000 dwellings hit.

Over 6,000 lives were taken in these fires, about half of them children. Losses to homeowners mounted to $346,200,000.

Each day in 1960, on the average, the cost of home fires was 17 lives, 1,540 houses destroyed or damaged, and almost $1,000,000 in money.

Major factors in fire deaths in homes were inadequate escape arrangements and failure to be prepared for fire emergencies. About one-third of the child victims were alone and unattended when fire struck.

Almost half the dollar increase came from a single fire, the $48,000,000 fire of last December aboard the nearly-completed U.S.S. Constellation at Brooklyn Navy Yard, which also caused 50 deaths.

Industrial Fires

Residential building fire accounted for nearly $25,000,000 of the increase, industrial plant damage rose about $14,600,000, and the loss from forest fires was up nearly $12,900,000.

While losses in public schools declined somewhat, damage in college and other educational buildings rose sharply. The number of retail store fires was reduced, but the loss total increased. Fire damage to aircraft declined, while motor vehicle fires rose in number and cost.

Improved records were compiled by churches, by hospitals and other institutions, by office buildings and banks, and by warehouses and other storage facilities.

Building Fires

There were 890,200 fires in buildings of all types which were responsible for almost $1,140,000,000 in losses, nearly 75 percent of the year's total.

Nonbuilding fires—principally aircraft, motor vehicles, forest, ship, rubbish and grass fires—numbered 1,233,660 and caused losses of $404,500,000.

A Fire-fighter Shows How to Put Out A Trash Fire With a New Multi-Purpose Dry Chemical Extinguisher

TOP—Fire-fighter approaches fire with wind at his back, aiming high velocity, long range extinguisher stream at near edge of flames.

LEFT—Once the flames are knocked down by extinguishant, smoking rubbish is kicked apart.

RIGHT—Fire-fighter continues to discharge chemical into area until all embers are out.

MULTI-PURPOSE EXTINGUISHERS REQUIRE DIFFERENT TECHNIQUE

The recommended technique for extinguishing fires using the new Underwriters'-approved multi-purpose, extinguishing agent for all classes of fire, is somewhat different from that used in fighting fires with regular dry chemical, fire engineers of the Ansul Chemical Company report.

The stream delivered by the new extinguishers is narrower and has a higher velocity and longer range than the regular dry chemical extinguishers, which deliver a fan-shaped stream. As a result, the extinguishing technique should be changed, especially for Class A fires, such as wood, cloth, paper and rubber tires.

Class A Fires

This means that the fire fighter should open the nozzle of his unit approximately 10 to 12 feet from the Class A fires, taking full advantage of the long-range stream. The flame is then extinguished, using a fast horizontal or vertical sweeping action, depending on the configuration of the burning material. In some cases, it may be necessary for the operator to move around to the sides or in back of the fire. Once the flame is extinguished, the operator should close the nozzle and kick the material apart, if possible. Additional chemical should then be applied to any visible glowing areas or to reflashes which may occur, using intermittent discharge to conserve the agent.

When applied to a Class A fire, the new agent clings to the hot surface, a thin fire retardant coating being formed which tends to prevent reflash. Ansul engineers point out it is not necessary to build up a heavy layer of the agent on the burning or glowing surface of Class A material to achieve extinguishment, since such a layer provides little or no increase in extinguishing effectiveness.

Class B Fires

The recommended technique for extinguishing Class B fires is the

same as for usual dry chemical models. On flammable liquids in depth and on spill fires, the nozzle is initially opened approximately 10 to 12 feet from the fire. The stream is directed at the base of the flames, using a side to side sweeping motion to gain full coverage.

As the intensity of the fire is reduced, the operator advances at the rate the flame front is being pushed back, until complete extinguishment is accomplished.

Development work has shown, when properly applied, the Class B effectiveness of the multi-purpose agent is equal to or better than the Class B effectiveness of regular dry chemical. On Class A fires, the new agent provides extremely rapid knockdown of flame and fast, complete extinguishment. On a pound for pound basis, the engineers report the new agent to be 22 percent to 84 percent more effective than water on some Class A fires. For example, on an Underwriters' Laboratories wood panel fire test, 3¾ gallons of water (weighing 31.3 pounds) receives a 3-A classification. An extinguisher containing 17 pounds of the all-class agent receives the same 3-A classification.

Pictures from Ansul Chemical Co.

Public Enemy No. 1 among fire causes is careless smoking and use of matches, National Fire Protection Association studies show. It is responsible for more than 200,000 fires and 1,200 fire deaths each year in this country.

Hospital Fire Problems

Life safety is one of the most challenging problems present when fire protection for hospitals is planned. The public rightly expects hospitals to take every possible precaution to assure the safety of patients in their care. Yet in hospital after hospital, there are existing physical conditions which continue to pose a fire threat to those in the building.

The entire question of fire safety in hospitals—large and small, state and private—is covered in a penetrating new study prepared by the National Fire Protection Association, Boston, the non-profit international center of information on fire safety. The report gives a point-by-point program for the protection of patients, staff and property in the event of fire.

How to warn and evacuate the occupants of the building if fire breaks out, and how to confine a fire and its destruction to the smallest possible area, are two of the most important problems considered. Also detailed is a plan to train hospital staffs for "fire action," and a list of sources of authoritative information on improving a hospital's protective measures.

Eight tables pinpoint when and how hospital fires occur, causes of fatal and non-fatal hospital injuries from fire, effect of sprinklers, etc.

One section of the report deals with the special fire hazards peculiar to hospitals including the handling of oxygen, oxygen cylinders and tents, the hazards of anesthetics and refrigerators and how to protect areas of extra hazard.

Published as Fire Record Bulletin FR 61-1, it is available (at 50 cents a copy) from the National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass.

Les Key (left), fire Control Chief of The Roberts Co., describes the company's automatic sprinkler control equipment to members of the Los Angeles County Fire Prevention Bureau.

Roberts Co. Commended For Fire Safety

Following a recent commendation for fire safety, The Roberts Co., City of Industry, California, was cited by Captain Frank Donohue of the County of Los Angeles Fire Prevention Bureau as an example of fire cooperation on the part of a manufacturing plant in assuring maximum safety for equipment and personnel. Local newspaper reporters and photographers, seeking information for articles on Fire Prevention Week, were invited by Donohue to meet him at The Roberts Co. plant to examine and photograph the many devices and systems developed and installed by this far-sighted company.

Outstanding among the many safety devices is a waterfall in the paint spray booth where basic coats are applied to the company's metal door products. The waterfall absorbs and renders harmless the highly flammable fumes that represent a real fire and health hazard. Equally effective is a sawdust collector in the section of the plant devoted to cutting and sanding plywood strips. The sawdust is gathered by a suction-type device, invented by the company, and deposited in a receptacle outside the building where it can be easily carted away.

"We realize," commented Hugh Livie, The Roberts Co. president, "that the tremendous toll of fire damage runs into the billions each year in property alone, not to mention loss of life. We feel that our investment in fire safety is well worth the expenditure it entails."

INDUSTRIAL HYGIENE AND HEALTH CONSERVATION

Edited By

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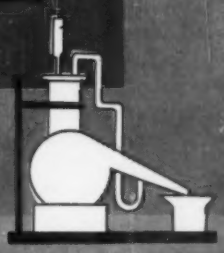

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Industrial Hygiene Monograph: Methyl Alcohol

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Training Systems in Radiochemistry

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Self-Dumping Hoppers for Dust Collectors

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Safety Limits of Hazardous Materials

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Keeping Up With First Aid Developments

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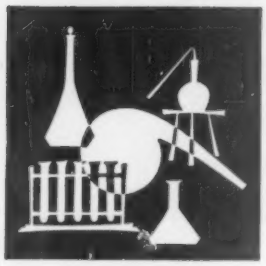
METHYL ALCOHOL

(Methanol)

INDUSTRIAL HYGIENE MONOGRAPH #4



by MARK M. LUCKENS

SYNONYMS: Wood alcohol, wood spirit, wood naphtha, columbian spirit, carbinol

A. Chemical and Physical Data:

Formula:	$H_3C.OH$
Molecular weight:	32.042
Usual form:	Liquid . . . clear, colorless, hygroscopic, volatile
Odor:	Faint odor, reminiscent of ethyl (grain) alcohol, when pure; impure technical products have a disagreeable pungent odor.
Density:	$0.7924\ d_{20}^{20}$ (°C) $0.7915\ d_{4}^{20}$ (°C)
Vapor density:	1.11 (air = 1.0)
Vapor pressure:	96.0 mm. Hg. @ 20°C
Evaporation Time:	6.3 (ethyl ether = 1)
Refractive Index:	n_D^{20} 1.3292 n_D^{15} 1.33066
Melting Point:	−97.8°C
Boiling Point:	64.65°C
Flash Point:	12.°C (54°F)
Ignition Temperature:	470°C (878°F)
Explosive Limits:	6.0–36.5% (by volume, in air)
Solubility:	Soluble in all proportions in water, ethyl ether, ethyl alcohol, most organic solvents—including the halogenated hydrocarbons; partially miscible with benzene, fats and oils, many petroleum hydrocarbons.
Miscellaneous:	1. burns, in air, with a pale blue flame 2. saturated air contains 21.05% (by volume) of methyl alcohol at 30°C. Density of this mixture = 1.02 (air = 1)
Metrology:	1. 1 ppm ≏ 1.31mg/M³ @ 25°C, 760 mm Hg. 2. 1mg/L ≏ 764 ppm.
Corrosivity:	1. corrosive to magnesium and aluminum, at normal temperatures 2. corrosive to iron and steel, at elevated temperatures
Threshold Limit Value:	200 ppm; 260 mg/M³ (approx).

B. Manufacture:

1. Distillation of wood (obsolete)
2. Synthetic: from carbon monoxide and hydrogen, carbon dioxide and hydrogen, oxidation of hydrocarbons (high purity products).

C. Uses:

1. Paint, varnish, and lacquer industry: paints, enamels, varnishes, lacquers, shellacs, wood stains; paint and varnish removers
2. Chemical Process Industries: Intermediate in manufacturing formaldehyde and formic acid, methylation, chemical specialties for industrial and household use, solvent for recrystallization and other purposes, textile soaps, dyes, denaturant for ethyl alcohol
3. Plastics and Related Industries: celluloid, films, nonshatterable glass, artificial leather.
4. Embalming fluids

5. Antifreezes, motor fuel additives
6. Miscellaneous: Solvent in shoe manufacture, dyeing and coloring, artificial flowers, stiffening agent in hat manufacture, painting and decorating, "sterno" or gel-type fuels, laboratory solvent.

D. Toxicity:

Poisoning may occur by all routes of entry, e.g., ingestion, inhalation, skin. Methyl alcohol is a powerful narcotic and is irritating to the mucous membranes. It has additional toxic effects, probably related to the products resulting from its metabolism in the body and its relatively slow rate of elimination.

The absorption of methyl alcohol from the stomach and intestinal tract and its distribution throughout the body approximates that of ethyl alcohol. However, it is eliminated from the body at approximately one fifth the rate of ethyl alcohol. Methyl alcohol can be detected for as much as four days after ingestion. This has an important bearing on the effects of and treatment for poisoning by this substance. Methyl alcohol concentrations in the body may "build up," in chronic exposures. Methyl alcohol is partially eliminated, unchanged, in the urine and breath and partially converted, in the body, to formic acid probably through preliminary conversion to formaldehyde. Formaldehyde has not been, unequivocally, recovered from tissues of men or animals poisoned with methyl alcohol. An outstanding feature of methyl acohol poisoning is its tendency to affect the eye and the optic nerve producing visual disturbances and blindness which may become permanent. Individual susceptibility may play a role in industrial intoxications arising from exposure to this compound.

It has been demonstrated, experimentally, that, for equal concentrations maintained in the body, ethyl alcohol is more toxic than methyl alcohol. However, since the former is eliminated much more rapidly, the net effect is that the latter is more toxic. The chronic effects of methyl alcohol are much more severe than those of ethyl alcohol. The reasons for this have been noted earlier. The poisonous effects of methyl alcohol have been attributed to its slow rate of elimination; the production of formaldehyde, formic acid, and formates; the severe acidosis following methyl alcohol ingestion; and the action of methyl alcohol itself. There is little doubt but that the toxicity of this compound is due to factors other than its action as a primary aliphatic alcohol.

Fatalities have been reported from the ingestion of less than 30 ml (approx. 1 oz) of methyl alcohol. The usual fatal dose is within the range of 100–250 ml (4–9 oz). In animal experiments, it has been shown that death can result from inhalation of this alcohol. Deaths from inhalation, in man, have been reported. There is some evidence that the auditory as well as the optic nerve may be affected by methyl alcohol. In addition to fatalities, narcosis, irritation, and eye lesions, there have been reports of peripheral neuritis and cerebrospinal lesions associated with exposure to methyl alcohol.

From all this, it would appear that methyl alcohol is one of the most dangerous of solvents. This is, however, not borne out by closer examination of the available data. There can be no doubt that severe poisonings have occurred when there has been exposure to the fumes of this alcohol in confined or poorly ventilated places. Many of the instances of methyl alcohol intoxication include evidence of drinking the compound or getting large quantities of it on the skin. Whenever proper precautions are exercised, the hazard is not sufficiently great to suggest its elimination.

E. Symptoms

1. Acute (all routes)

a. Mild:—headache, nausea, fatigue, moderate gastro-intestinal disturbances, temporary blurring of vision may occur after a latent period.

b. Moderate:—nausea, vomiting, diarrhea, severe headache, cyanosis, restlessness, labored respiration, debility, pupils usually dilated, impairment of vision (often after a latent period of 2–6 days). Difficulty in breathing is a bad sign and indicates that the condition of the patient may take a turn for the worse.

c. Severe:—Symptoms noted above more marked, breathing rapid and shallow, or deep and labored, coma, fall in blood pressure, pulse rapid and weak, apathy, weakness, collapse, abdominal pain, colic. Patient may show excitement, mania, and suffer from hallucinations, convulsions; visual disturbances ranging from mild photophobia to complete blindness. Rate of mortality (very high) occurs in 25% of cases of severe poisoning.

2. Chronic

a. Inhalation:—Irritation of mucous membranes, eyes, and the respiratory tract—leading to conjunctivitis, bronchitis, tracheitis, etc. . . . headache, vertigo, gastric disturbances, pain in the chest, visual impairment, photophobia. Visual impairment may be the first positive sign of poisoning.

b. Skin:—irritation, dermatitis. Given sufficient length of exposure and concentration of methyl alcohol, systemic poisoning will occur with symptoms as noted earlier.

c. Eyes:—lacrimation and burning. Splashes of methyl alcohol in the eyes can lead to chemosis and lesions of the cornea which may, occasionally, be serious.

F. Treatment

1. Acute Poisoning:

a. Remove the poison from the stomach by gastric lavage with two (2) to four (4) quarts of water containing 1–2% sodium carbonate (approximately 1 heaping teaspoonful per quart). Saline cathartics, preceded by charcoal and followed by ample fluids have been suggested as a possible alternative.

b. It is preferable to hospitalize the patient, especially in moderate to severe poisonings.

c. Give ethyl alcohol (in quantity sufficient to maintain a concentration of 0.1% in the blood) . . . approximately 1 ounce of whiskey every 4 hours. This procedure should be continued for 4 days to block the metabolism of the methyl alcohol. (This part of the

treatment has been questioned on the basis that there have been fatalities as a result of the ingestion of ethyl alcohol denatured with methyl alcohol even when analysis showed much ethyl alcohol in the bodies of the victim.)

d. **Combat acidosis** . . . give 3–5 grams of sodium bicarbonate, every hour, until the urine becomes alkaline (pH7.5). I.V. Sodium lactate (M/6) or sodium bicarbonate 0.8 gm/Kg may be indicated, especially if the CO_2 combining power is less than 20 vol.%. When special solutions are not available 50 gms of sodium bicarbonate may be dissolved in 1 litre of 5% dextrose. CO_2 *combining power* should be checked *every few hours.* A constant check on the pH of the urine should be kept. *It is as important to prevent alkalosis as it is to combat acidosis.* Either can lead to fatality. Maintain an alkaline (ph 7.5) urine until danger of acidosis is past.

e. If cyanosis is present, oxygen may be administered. In severe cases, venesection and subsquent infusion of saline may be indicated.

f. Maintain urinary output by giving up to 4 litres of water daily by mouth or I.V.

g. Maintain body temperature.

h. Maintain adequate nutrition by frequent small meals.

i. Delirium may be controlled by pentobarbital sodium. However, care must be exercised to prevent respiratory depression.

j. Administration of thiamine hydrochloride has been suggested for the alleviation of visual disturbances.

2. Chronic Poisoning:

Remove individual from exposure. A complete physical examination including opthalmalogic work-up should be done. Treatment–based upon medical findings.

G. First Aid

1. **CALL PHYSICIAN IMMEDIATELY**
2. **REMOVE FROM EXPOSURE**
3. **If breathing has stopped**–artificial respiration. Mechancial resuscitation equipment should only be used by a person qualified and trained in its use.
4. **If patient is unconscious**–do not give anything by mouth.
5. **For skin contact**–remove all contaminated clothing and flush area with water for at least 10 minutes.
6. **Eyes**–wash with large amounts of water for at least 15 minutes.
7. **Ingestion**–induce vomiting.
8. **In all cases**–keep patient warm, cover eyes to exclude light.

H. Laboratory Procedures

1. Diagnosis and Treatment.

a. Methyl alcohol concentration (blood/urine)–Various procedures utilizing chromotropic acid are available.

b. Carbon dioxide combining power of plasma

c. Plasma bicarbonate

2. Detection and Estimation

a. Sampling of Atmospheres:–using bubbler or trap, absorb methanol in distilled water

b. Analysis:–various chromotropic acid procedures.

I. Fire Hazard

Methyl alcohol is volatile and flammable. Suitable precautions should be taken in storage and use. Use of this compound in open systems constitutes a serious fire hazard.

J. Equipment Hazards

At elevated temperatures methyl alcohol vapor, in the presence of water, is corrosive to iron and steel.

K. Storage

Storage of methyl alcohol should conform to specifications outlined by the National Board of Fire Underwriters. (See their pamphlet No. 30–"Storage, Handling, and Use of Flammable Liquids")

L. Employee Education

Employees using methyl alcohol should be given training in the proper handling of this compound and the use of personal protective equipment. Because of individual susceptibility to this compound, workers with histories of sensitivity to methyl alcohol should not be assigned to tasks involving handling or use of this material. People who have chronic eye conditions or are alcoholics should not be employed where methyl alcohol is handled or where vapors of this liquid are present.

M. Engineering Control

1. Processes employing methyl alcohol should be enclosed, whenever possible.

2. Mechanical exhaust equipment, when used, should not draw significant quantities of the vapor through the breathing zone of workers.

3. Electrical installation in areas should conform with specifications of the National Electrical Code for Class I, Group D hazardous locations.

4. Openings in systems containing methyl alcohol vapors should be protected with "flash screens" and terminate in the outdoors.

N. Personal Protective Equipment

1. Safety goggles (chemical type)

2. Industrial type gas masks with canisters approved by U. S. Bureau of Mines Type B–Organic Vapor Exposure (where vapor concentration is less than 2%).

3. For heavily contaminated areas–Supplied air respirator, Type C, air line respirator, as approved by U. S. Bureau of Mines or approved self-contained breathing apparatus. To be used only by employees experienced in the work to be done. Rescue harness and life line–a second employee should be stationed immediately outside the hazardous area. Workers assigned to enter the area or to be stationed at the outside should be thoroughly trained in the task and their duties.

Training Systems In Radiochemistry

The Atomic Energy Commission has made available the first of a series of engineering drawings related to training in radioisotope engineering for colleges and universities. Twelve prototype instruments have been developed to demonstrate a variety of principles and uses of radioisotopes and radiation. Working models of these instruments may be built from the drawings for laboratory use. These demonstrate such things as low level counting, gamma ray spectrometry, leak detection, tracer studies and other useful research and industrial radiation techniques.

The project is part of a continuing educational program in isotope technology conducted by the Office of Isotopes Development. The objectives of these training systems are to increase training value, decrease cost of construction, and optimize general usefulness in the training laboratory.

These training systems have greater student access and flexibility for demonstration purposes than the corresponding commercial counterpart whose stringent specifications, cost and size limit their availability, and usefulness in the classroom. Another motivation of the development of these systems is the simple economics of equipping the many educational institutions and training laboratories which are seeking to include laboratory isotope training in their curricula.

These training systems can be divided into three separate groups for the following demonstrations:

I. Radiochemical Instrumentation Group

A. Liquid scintillation counting of carbon-14 and tritium—CAPE-812
B. Low-level beta counting—CAPE-814
C. Health physics monitoring of natural radon—CAPE-815
D. Tracer leak detection—CAPE-816
E. Gamma ray spectrometry—CAPE-817
F. Solid state alpha detectors—CAPE-818

Much of the equipment in this group is interchangeable for the various demonstrations, thus resulting in a substantial savings in construction cost.

II. Industrial Gauging Group

A. Beta thickness gauging—CAPE-811
B. Density and level gauging—CAPE-813
C. Tracer flow rates—CAPE-819
D. Tracer wear studies—CAPE-820

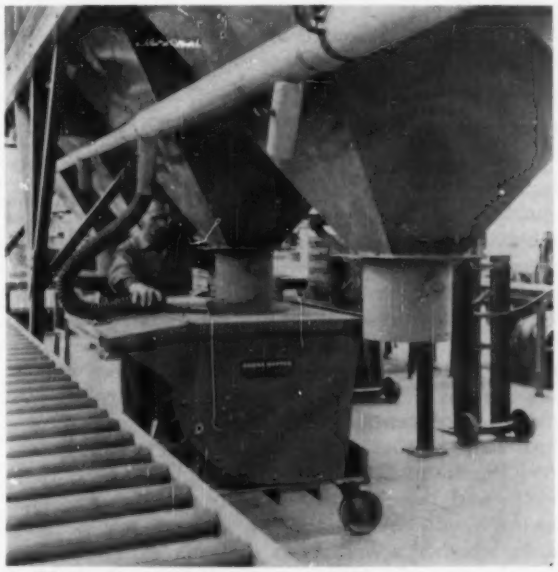
III. Research and Process Analyses

A. Gas chromatography and radiotracer system—CAPE-821
B. Carbon-hydrogen analyzer—CAPE-822

At the present time, the instruments developed under the project are being tested and evaluated at several universities and training laboratories.

The engineering materials will be organized into packages and announced in TID-4100, *Engineering Materials List*, Supplements 13 and 14. This catalog is available without charge through the Office of Technical Information Extension, P. O. Box 62, Oak Ridge, Tenn. Code numbers assigned to the drawings are CAPE-811 through CAPE-822. The first three packages CAPE-811, 812 and 813 are now available to the public. The remaining packages will be reproduced and announced, through the catalog TID-4100, as they become available. Fullsized, blueline prints can be purchased from the Cooper-Trent Blueprint & Microfilm Corp., 2701 Wilson Boulevard, Arlington 1, Va. These prints will be sold at $0.17 per square foot, f.o.b. contractor's plant.

The Office of Technical Information Extension will continue to prepare and distribute, free of charge, Supplements to the *Engineering Materials List* to announce new materials that are available.



Self-Dumping Hoppers For Dust Collectors

Self-dumping hoppers simplify disposal of dust and fines drawn off from dust collection bins at the Norton Company's Plant 8 in Worcester, Mass.

Dust is generated during production of grinding wheels and is collected by vacuum systems in various parts of the plant. This system feeds to overhead collector bins at centralized points. Bins must be emptied daily.

To handle discharge from bins, Norton's plant engineers procured six specially fitted self-dumping hoppers of ½-cu. yd. capacity. Hoppers are caster-mounted for easy positioning under bins.

Hoppers are fitted with a hinged, dust-tight cover which have a circular opening to fit discharge spout of collector bin. A U-shaped collar is welded around the circular opening. When dust is emptied into the hoppers, a portable vacuum line is held at the open end of the collar to pick up dust that rises as collected material flows into hopper.

Filled hoppers are taken to a loading dock by a fork lift truck and the hoppers are emptied by tripping a release lever on the back of the units. They tilt forward to discharge material, then rock back to upright position.

Picture by courtesy of Roura Iron Works, Inc.

SAFETY LIMITS OF HAZARDOUS MATERIALS

Adopted at the Twenty-Third Annual Meeting of the American Conference of Governmental Industrial Hygienists, Detroit, April 9–12, 1961 [1]

Threshold limits should be used as guides in the control of health hazards and should not be regarded as fine lines between safe and dangerous concentrations. They represent conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse effect. The values listed refer to time-weighted average concentrations for a normal workday. The amount by which these figures may be exceeded for short periods without injury to health depends upon a number of factors such as the nature of the contaminant, whether very high concentrations even for short periods produce acute poisoning, whether the effects are cumulative, the frequency with which high concentrations occur, and the duration of such periods. All must be taken into consideration in arriving at a decision as to whether a hazardous situation exists. Special consideration should be given to the application of these values in assessing the health hazards which may be associated with exposure to combinations of two or more substances.

Threshold limits are based on the best available information from industrial experience, from experimental studies, and, when possible, from a combination of the two. These values are based on various criteria of toxic effects or on marked discomfort; thus, they should not be used as a common denominator of toxicity, nor should they be considered as the sole criterion in proving or disproving diagnosis of suspected occupational disease.

These limits are intended for use in the field of industrial hygiene and should be employed by persons trained in this field. They are not intended for use, or for modification for use, in the evaluation or control of community air pollution or air pollution nuisances.

These values are reviewed annually by the Committee on Threshold Limits for changes, revisions, or additions as further information becomes available. The Committee welcomes the suggestion of substances to be added to the list and also comments, references, or reports of experience with these materials.

RECOMMENDED VALUES
Gases and Vapors

Substance	PPM	Approx. Mg. per Cu. M.
Acetaldehyde	200	360
Acetic acid	10	25
Acetic anhydride	5	20
Acetone	1000	2400
Acetylene tetrabromide	1	14
Acrolein	0.5	1.2
Acrylonitrile—skin	20	45
Allyl alcohol—skin	2	5
Allyl chloride	5	15
Allyl propyl disulfide	2	12
Ammonia	100	70
Amyl acetate	200	1050
Amyl alcohol (isoamyl alcohol)	100	360
Aniline—skin	5	19
Arsine	0.05	0.2
Benzene (benzol)	25	80
Benzyl chloride	1	5
Boron trifluoride	1	3
Bromine	0.1	0.7
Butadiene (1, 3-butadiene)	1000	2200
2-Butanone (methyl ethyl ketone)	200	590
Butyl acetate (n-butyl acetate)	200	950
Butyl alcohol (n-butanol)	100	300
tert. Butyl alcohol	100	300
Butylamine	5	15
Butyl cellosolve (2-butoxyethanol)	50	240
p-tert. Butyltoluene	10	60
Carbon dioxide	5000	9000
Carbon disulfide—skin	20	60
Carbon monoxide	100	110
Carbon tetrachloride—skin	25	160
Cellosolve (2-ethoxyethanol)	200	740
Cellosolve acetate (2-ethoxyethyl acetate)	100	540
Chlorine	1	3
Chlorine dioxide	0.1	0.3
Chlorine trifluoride	0.1	0.4
Chlorobenzene (monochlorobenzene)	75	350
Chloroform (trichloromethane)	50	240
1-Chloro-1-nitropropane	20	100

1 Reprinted with permission from the American Conference of Governmental Industrial Hygienists.

Note: The word "skin" following a compound's name indicates that the liquid compound can penetrate the skin to cause systemic effects.

Substance	PPM	Approx. Mg. per Cu. M.
Chloropicrin	0.1	0.7
Chloroprene (2-chloro-1, 3-butadiene)	25	90
Cresol (all isomers)—skin	5	22
Cyclohexane	400	1400
Cyclohexanol	50	200
Cyclohexanone	50	200
Cyclohexene	400	1350
Decaborane—skin	0.05	0.3
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	50	240
Diborane	0.1	0.1
o-Dichlorobenzene	50	300
p-Dichlorobenzene	75	450
Dichlorodifluoromethane	1000	4950
1, 1-Dichloroethane	100	400
1, 2-Dichloroethane (ethylene dichloride)	100	400
1, 2-Dichloroethylene	200	790
Dichloroethyl ether	15	90
Dichloromonofluoromethane	1000	4200
1, 1-Dichloro-1-nitroethane	10	60
Dichlorotetrafluoroethane	1000	7000
Diethylamine	25	75
Difluorodibromomethane	100	860
Diisobutyl ketone	50	290
Dimethylaniline (N-dimethylaniline)—skin	5	25
Dimethylformamide	20	60
1, 1-Dimethylhydrazine—skin	0.5	1
Dimethylsulfate—skin	1	5
Dipropylene glycol methyl ether	100	600
Dioxane (diethylene dioxide)	100	360
Ethyl acetate	400	1400
Ethyl acrylate—skin	25	100
Ethyl alcohol (ethanol)	1000	1900
Ethylamine	25	45
Ethylbenzene	200	870
Ethyl bromide	200	890
Ethyl chloride	1000	2600
Ethyl ether	400	1200
Ethyl formate	100	300
Ethyl silicate	100	850
Ethylene chlorohydrin—skin	5	16
Ethylenediamine	10	30
Ethylene dibromide (1, 2-dibromoethane)	25	190
Ethylene imine—skin	5	9
Ethylene oxide	50	90
Fluorine	0.1	0.2
Fluorotrichloromethane	1000	5600
Formaldehyde	5	6
Furfural	5	20
Furfuryl alcohol	50	200
Gasoline	500	2000
Heptane (n-heptane)	500	2000
Hexane (n-hexane)	500	1800
Hexanone (methyl butyl ketone)	100	410
Hexone (methyl isobutyl ketone)	100	410
Hydrazine—skin	1	1.3
Hydrogen bromide	3	10
Hydrogen chloride	5	7
Hydrogen cyanide—skin	10	11
Hydrogen fluoride	3	2
Hydrogen peroxide, 90%	1	1.4
Hydrogen selenide	0.05	0.2
Hydrogen sulfide	20	30
Iodine	0.1	1
Isophorone	25	140
Isopropylamine	5	12
Mesityl oxide	25	100
Methyl acetate	200	610
Methyl acetylene	1000	1650
Methyl acrylate—skin	10	35
Methylal (dimethoxymethane)	1000	3100
Methyl alcohol (methanol)	200	260
Methyl bromide—skin	20	80
Methyl cellosolve (2-methoxyethanol)	25	80
Methyl cellosolve acetate (ethylene glycol monomethyl ether acetate)	25	120
Methyl chloride	100	210
Methyl chloroform (1, 1, 1-trichloroethane)	500	2700
Methylcyclohexane	500	2000
Methylcyclohexanol	100	470
Methylcyclohexanone	100	460
Methyl formate	100	250
Methyl isobutyl carbinol (methyl amyl alcohol)	25	100
α-Methyl styrene	100	480
Methylene chloride (dichloromethane)	500	1750
Monomethyl aniline—skin	2	9
Naphtha (coal tar)	200	800
Naphtha (petroleum)	500	2000
Nickel carbonyl	0.001	0.007
Nitric acid	10	25
p-Nitroaniline—skin	1	6
Nitrobenzene—skin	1	5
Nitroethane	100	310
Nitrogen dioxide	5	9
Nitroglycerin	0.5	5
Nitromethane	100	250
2-Nitropropane	25	90
Nitrotoluene—skin	5	30
Octane	500	2350
Ozone	0.1	0.2
Pentane	1000	2950
Pentanone (methyl propyl ketone)	200	700
Perchloroethylene (tetrachloroethylene)	100	670
Phenol—skin	5	19
Phenylhydrazine—skin	5	22
Phosgene (carbonyl chloride)	1	4
Phosphine	0.05	0.07
Phosphorus trichloride	0.5	3
Propyl acetate	200	840
Propyl alcohol (isopropyl alcohol)	400	980
Propyl ether (isopropyl ether)	500	2100
Propylene dichloride (1, 2-dichloropropane)	75	350
Propylene imine—skin	25	60
Propylene oxide	100	240
Pyridine	5	15
Quinone	0.1	0.4
Stibine	0.1	0.5
Stoddard solvent	500	2900
Styrene monomer (phenylethylene)	100	420
Sulfur dioxide	5	13
Sulfur hexafluoride	1000	6000
Sulfur monochloride	1	6
Sulfur pentafluoride	0.025	0.25
1, 1, 2, 2-Tetrachloroethane—skin	5	35
Tetrahydrofuran	200	590
Tetranitromethane	1	8
Toluene (toluol)	200	750
o-Toluidine—skin	5	22
Tolylene-2, 4-diisocyanate	0.02*	0.14*
Trichloroethylene	100	520
Triethylamine	25	100
Trifluoromonobromomethane	1000	6100
Turpentine	100	560
Vinyl chloride (chloroethylene)	500	1300
Vinyl toluene	100	480
Xylene (xylol)	200	870
Xylidine—skin	5	25

* Probably sufficiently low to protect against primary sensitization, but may not protect persons specifically sensitized.

Dusts, Fumes and Mists

Substance	Mg. per Cu. M.
Aldrin (1, 2, 3, 4, 10, 10-hexachloro-1,4, 4a, 5, 8, 8a-hexahydro-1, 4, 5, 8-dimethanonaphthalene)—skin	0.25
Ammate (ammonium sulfamate)	15
Antimony	0.5
ANTU (alpha-naphthyl-thiourea)	0.3
Arsenic	0.5
Barium (soluble compounds)	0.5

Substance	Mg. per Cu. M.
Beryllium	0.002
Cadmium oxide fume	0.1
Calcium arsenate	0.1
Chlordane (1, 2, 4, 5, 6, 7, 8, 8-octachloro-3a, 4, 7, 7a-tetra-hydro-4, 7-methanoindane)	2
Chlorinated camphene, 60%	0.5
Chlorinated diphenyl oxide	0.5
Chlorodiphenyl (42% chlorine)—skin	1
Chlorodiphenyl (54% chlorine)—skin	0.5
Chromic acid and chromates (as CrO_3)	0.1
Crag herbicide (sodium 2- (2, 4-dichlorophenoxy) ethanol hydrogen sulfate)	15
Cyanide (as CN)—skin	5
2, 4-D (2, 4-dichlorophenoxyacetic acid)	10
DDT (2, 2-bis (p-chlorophenyl)-1, 1, 1-trichloroethane)	1
Dieldrin (1, 2, 3, 4, 10, 10-hexachloro-6, 7-epoxy-1, 4, 4a, 5, 6, 7, 8, 8a-octahydro-1, 4, 5, 8-dimethanonaphthalene)—skin	0.25
Dinitrobenzene—skin	1
Dinitrotoluene—skin	1.5
Dinitro-o-cresol—skin	0.2
EPN (O-ethyl O-p-nitrophenyl thionobenzenephosphonate)—skin	0.5
Ferbam (ferric dimethyl dithiocarbamate)	15
Ferrovanadium dust	1
Fluoride	2.5
Hydroquinone	2
Iron oxide fume	15
Lead	0.2
Lead arsenate	0.15
Lindane (hexachlorocyclohexane, gamma isomer)	0.5
Lithium hydride	0.025
Magnesium oxide fume	15
Malathion (O, O-dimethyl dithiophosphate of diethyl mercaptosuccinate)—skin	15
Manganese	5
Mercury	0.1
Mercury (organic compounds)—skin	0.01
Methoxychlor (2, 2-di-p-methoxyphenyl-1, 1, 1-trichloroethane)	15
Molybdenum	
(soluble compounds)	5
(insoluble compounds)	15
Nicotine—skin	0.5
Parathion (O, O-diethyl-O-p-nitrophenyl thiophosphate)—skin	0.1
Pentachloronaphthalene—skin	0.5
Pentachlorophenol—skin	0.5
Phosphoric acid	1
Phosphorus (yellow)	0.1
Phosphorus pentachloride	1
Phosphorus pentasulfide	1
Picric acid—skin	0.1
Pyrethrum	2
Rotenone	5
Selenium compounds (as Se)	0.1
Sodium fluoroacetate (1080)—skin	0.1
Sodium hydroxide	2
Strychnine	0.15
Sulfuric acid	1
TEDP (tetraethyl dithionopyrophosphate)—skin	0.2
TEPP (tetraethyl pyrophosphate)—skin	0.05
Tellurium	0.1
Tetryl (2, 4, 6-trinitrophenylmethylnitramine)—skin	1.5
Thallium (soluble compounds)	0.1
Thiram (tetramethyl thiuram disulfide)	5
Titanium dioxide	15
Trichloronaphthalene—skin	5
Trinitrotoluene—skin	1.5
Uranium	
(soluble compounds)	0.05
(insoluble compounds)	0.25
Vanadium	
(V_2O_5 dust)	0.5
(V_2O_5 fume)	0.1
Warfarin (3-(∝-acetonylbenzyl)-4-hydroxycoumarin)	0.5
Yttrium	5
Zinc oxide fume	15
Zirconium compounds (as Zr)	5

Radioactivity: For permissible concentrations of radisotopes in air, see U. S. Development of Commerce, National Bureau of Standards, Handbook 69, "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," June 5, 1959. Also, see U. S. Department of Commerce, National Bureau of Standards, Handbook 59, "Permissible Dose from External Sources of Ionizing Radiation," September 24, 1954, and addendum of April 15, 1958.

Mineral and Non-Metallic Inorganic Dusts

Substance	MPPCF
Silica	
Quartz	
high (above 50% free silica)	5
medium (5 to 50% free silica)	20
low (below 5% free silica)	50
Cristobalite (above 5%)	5
Amorphous	20
Silicates	
Asbestos	5
Mica	20
Portland Cement	50
Soapstone	20
Talc	20
Miscellaneous:	
Aluminum Oxide	50
Calcite	50
Dolomite	50
Limestone	50
Marble	50
Silicon Carbide	50
Other Inert Dusts	50

Tentative Values

Substance	PPM	Approx. Mg. per Cu. M.
Acetonitrile	40	70
Allyl glycidyl ether (AGE)	10	45
Boron oxide		15
tert. Butyl chromate (as CrO_3)		0.1
n-Butyl glycidyl ether (BGE)	50	270
Butyl mercaptan	10	35
Chloroacetaldehyde	1	3
Chlorobromomethane	200	1050
DDVP (O, O-Dimethyl-2, 2-Dichlorodivinyl phosphate)		1
Diglycidyl ether (DGE)	10	55
Dimethyl acetamide	10	35
Endrin (1, 2, 3, 4, 10, 10-hexachloro-6, 7-epoxy-1, 4, 4a, 5, 6, 7, 8, 8a-octa hydro-1, 4-endo, endo-5, 8-dimethanonaphthalene		0.25
Ethanol amine	0.5	1
Ethyl mercaptan	250	640
Glycidol	50	150
Heptachlor (1, 4, 5, 6, 7, 8, 8-heptachloro-3a, 4, 7, 7a-tetrahydro-4, 7-methanoindene)		0.25
sec-Hexyl acetate	100	590
Isopropyl glycidyl ether (IGE)	50	240
Ketene	0.5	0.9
Methyl mercaptan	50	100
1-Nitropropane	25	90
Pentaborane	0.005	0.01
Perchloromethyl mercaptan	0.1	0.8
Phenyl glycidyl ether (PGE)	50	310
Phosdrin (2-carbomethoxy-1-methyl vinyl dimethyl phosphate)		0.1
n-Propyl nitrate	25	110
Systox		0.2
2, 4, 5T (2, 4, 5-trichlorophenoxy acetic acid)		10
Teflon decomposition products (as F)		0.05
1, 2, 3-Trichloropropane	50	300
1, 1, 2-Trichloro-1, 2, 2-trifluoroethane	1000	7600
Triorthocresyl phosphate		0.1
Triphenyl phosphate		3

(Signed): William L. Ball, W. Clark Cooper, Herbert E. Stokinger, Keith H. Jacobson, Hervey B. Elkins, Russel G. Scovill, William F. Reindollar and Alan L. Coleman, Chairman.

Methyl Ethyl Ketone Safety

Properties and Essential Information for Safe Handling and Use of Methyl Ethyl Ketone is the title of latest chemical safety data sheet, SD-83, now available from the Manufacturing Chemists' Association, Inc. The safety data sheet details the properties, hazards, engineering control of hazards, employee safety, fire fighting, handling and storage, tank and equipment cleaning and repairs, waste disposal, medical management and first aid.

The pamphlet describes Methyl Ethyl Ketone as a flammable liquid with a low flash point, the vapors of which form explosive mixtures with air. SD-83 points out that although industrial use of this chemical does not present a serious health hazard, undesirable effects may occur from inhalation of excessive concentrations of vapor, prolonged or repeated skin contact with the liquid, and from contact of the liquid with eyes.

Copies of SD-83 are available for 30 cents per copy from the Manufacturing Chemists' Association, Inc., 1825 Connecticut Ave., N.W., Washington 9, D. C.

Hydrocyanic Acid Data Sheet

Hydrocyanic acid, its properties and recommended safe handling and use practices, are described in the latest in a series of chemical safety data sheets now available from the Manufacturing Chemists' Association, Inc.

The pamphlet, SD-67 (revised), details the engineering control of health, fire and explosion hazards of the chemical and discusses employee safety education and training and personal protective equipment recommended while handling it.

In addition, the pamphlet suggests proper handling and storage practices, tank and equipment cleaning and repair methods, waste disposal, medical management methods and first aid.

Copies of the safety data sheet are available from the Association at its headquarters, 1825 Connecticut Ave., N. W., Washington, D. C. for 30 cents each.

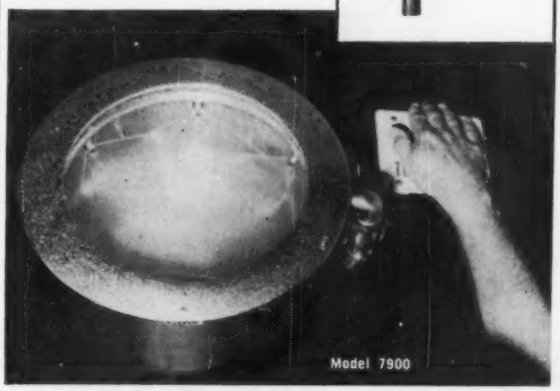
This revised edition of SD-67 differs from others of the MCA safety data sheets in that it contains detailed information on valves and piping for use in HCN service; on storage, including transfer of HCN from tank car to storage tank; and on procedures in time of emergency.

It was prepared by a number of specialists from MCA-member producers of hydrocyanic acid in cooperation with the General Safety and Medical Advisory Committees of the Association.

PROFESSIONAL SERVICES AVAILABLE

Professional safety engineer offers 30 years' experience with industrial and insurance engineering for consultation service; all phases accident and loss prevention. Available for New England, New York State and vicinity. Box 93, Best's Safety Publications, 75 Fulton Street, New York 38, N. Y.

SAFETY *...on tap!*



Another Haws "first"! Six spray nozzles ring this extra large stainless steel bowl—setting up a feather-soft "field of water" to instantly rid eyes, facial areas, even the entire head of searing chemicals. Less spillage, more coverage for first aid until medical help arrives. Haws means *positive* safety! Write for illustrated catalog today!

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(For details, use Key # M-7 on card on page 69)

Babbitt *Adjustable* **SPROCKET RIM**
with Chain Guide
CHANGES THAT DANGER ZONE TO A SAFETY ZONE

. . . enables you to
ADD PLANT AREA

If re-aligning equipment will yield more working space, better production, lower costs—do it now. Save all space wasted for placing ladders to reach overhead valves. At the same time, convert Danger Zones to Safety Zones. Equip every overhead valve wheel in your plant with Babbitt Adjustable Sprocket Rims with Chain Guides.

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- They fit any size valve wheel.
- They are easy to install and operate.
- They operate any valve from the floor.
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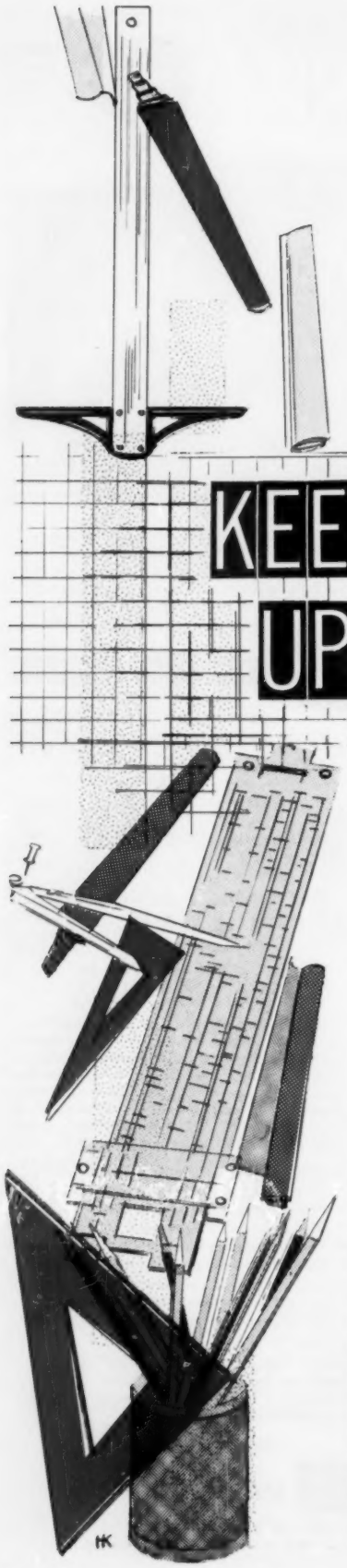
(For details, use Key # M-8 on card on page 69)



KEEPING UP WITH FIRST AID DEVELOPMENTS

NEW PROTECTIVE USE FOR SELF-ADHERING BANDAGE

Here is an adaptation of the self-adhering gauze type bandage for the protection of workers from wrist injuries. As reported by General Bandages, Inc., the manufacturer of Guardtex tapes, the special bandages are used as a comfortable, low-cost protection against wrist cuts and scratches by employees turning and handling sheet metal. Workers can apply the tapes themselves by giving a few wraps of the self-adhering gauze around their wrist and forearms.

For details, use **Key # FA-2** on inquiry card on page 69.

BURN SPRAY UNITS

The Americaine (R) burn treatment containing 20% dissolved benzocaine in a water soluble base is now available in aerosol form in C-Thru (R) unit packages for unit dressing first aid kits. Unit No. 140 Americaine Dispensor, two ¾ oz. aerosols per unit, is available from Davis Emergency Equipment Co., Inc. It provides a quick and easy method of applying this analgesic burn medication.

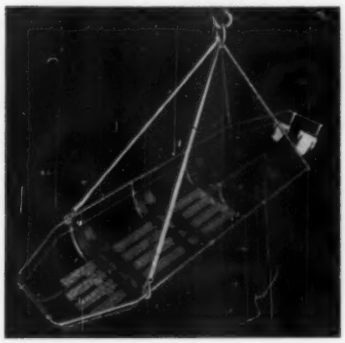
For details, use **Key # FA-1** on inquiry card on page 69.

FIRST AID KIT WITH OXYGEN SUPPLY

A new first aid kit that, in addition to standard first aid items, features a Lif-O-Gen Oxygen supply unit that provides oxygen for seven minutes is announced by A. E. Halperin Co. The oxygen unit is complete with disposable face mask for immediate use. Other supplies in the No. 75 Kit include ammonia inhalants and ampoules,

bandages, splints, dressing, tourniquet, scissors, antiseptic, etc. The 20-gauge steel kit is moistureproof and dustproof, has a carrying handle, and can be wall-mounted.

For details, use **Key # FA-3** on inquiry card on page 69.



NEW SLING FOR STRETCHER

A new universally adaptable nylon webbing bridle sling for use with the splint-type basket stretcher is a recent development of the Junkin Safety Appliance Company. The sling, consisting of two 1" nylon webbing straps, four forged safety hooks, and a 3" diameter center ring, provides an invaluable accessory where it is necessary to raise or lower the stretcher in either the horizontal or vertical position. By adjusting the webbing loop at the center ring accurate balance may always be obtained. The four safety hooks clamp directly around the main stretcher frame for complete lifting or lowering safety. Bridle is shown here with the Junkin SAF-300-A Civil Defense Splint Stretcher.

For details, use **Key # FA-4** on inquiry card on page 69.

BOAT FIRST AID KIT

A first aid kit, especially designed for boat use, has been announced by Otis Clapp & Son, Inc. The water-tight metal case will float and contains a large square of fluorescent-orange dyed duck for distress signalling purposes. First aid items include products for the treatment of cuts, bruises, chafing, sunburn, headache, fainting, slivers, toothache and eye strain.

For details, use **Key # FA-5** on inquiry card on page 69.

EMERGENCY EYE FOUNTAIN

A new emergency eye-wash fountain has been developed by Haws Drinking Faucet Co. This cast aluminum receptor comes ready for wall mounting. The Haws Model 7300, it provides invaluable first aid wherever contaminants such as acids, chemicals and volatile fuels are manufactured or used. Two chrome-plated brass fountain heads are angle-mounted to direct a stream of water into the eyes, flooding away foreign matter. A separate flow-control valve assures proper water volume and pressure. The large push-type valve provides fumble-proof operating control. Once activated the fountain continues to flow until the valve is manually closed. Both hands are left free.

For details, use **Key # FA-6** on inquiry card on page 69.

BURN TREATMENT SPRAY

An emergency treatment for thermal or electric burns is formulated by E. D. Bullard Co. to meet the medical requirements of this type of injury. Called ABT, the product, according to the company, is nontoxic; is easily applied from an aerosol container; is quickly absorbed by the skin but can be washed off if necessary; soothes damaged areas and relieves pain; does not cauterize or kill tissue; contains no water, acid, alkali or other irritant; prevents flow of lymph fluid and resultant blisters; and is antiseptic. Applied directly to wound or to compress. Available in two-can unit packs and also in 3-, 5-, and 11-ounce sizes.

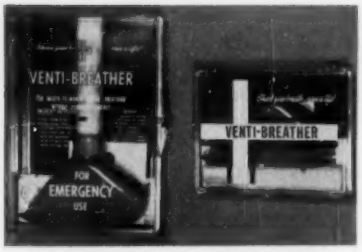
For details, use **Key # FA-7** on inquiry card on page 69.

NEW EMERGENCY SHOWER HEAD

A new impeller-action deluge shower head for emergency use where chemical and acid spills, clothing fires and similar hazards exist has been developed by Speakman Co. The new design produces a drenching, swirling sheet of water which floods the victim's body, quickly dousing fires and washing away harmful chemicals. The device, designated the S-800 Lifesaver shower head, contains an adjustable face and self-cleaning feature. Twelve impellers and two circular grooves in the face of the shower head produce the swirling action. Unit discharges up to 63 gallons per minute at 20 psi flow pressure with a 1-inch supply line (or 160 gpm with a 1½-inch supply line and flow pressure of 18 psi). Available in chrome-plated brass, lead-coated brass, cast aluminum, and other materials.

For details, use **Key # FA-8** on inquiry card on page 69.

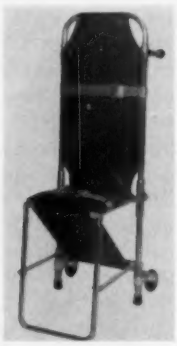
other articles
October and November



RESCUE BREATHING DEVICE

A new device has been introduced to permit "mouth-to-mouth" rescue breathing by untrained persons without personal contact with the victim. The Venti-Breather's flexible face mask separates the rescuer from the victim in a sanitary manner, and fits both adults and children. The rescuer breathes through a special tube to inflate the victim's lungs; as the victim's lungs deflate, a one-way valve directs his breath away from the rescuer's mouth and face. Nothing is inserted in the throat of the victim to cause gagging or injury. The unit is packaged in a non-rusting, see-through plastic case for convenient, sanitary storage in first aid kits, glove compartments, etc.

For details, use **Key # FA-9** on inquiry card on page 69.



FOLDING CHAIR-STRETCHER

A new combination stair chair and folding stretcher for all types of emergency transportation has been introduced by Ferno Mfg. Called the Ferno Model 107, it provides maximum patient comfort and security as a stair chair by new, nylon retaining straps, an open foot well, a padded seat and a positive-acting hinge that locks the chair frame firmly in place. As a stretcher, it is 72" long and lies absolutely flat for maximum patient comfort. Wheels and legs, which permit use as a second cot, fold under for compact storage. Unit weighs only 27 pounds and folds to 41-inch length for easy storage in ambulance.

For details, use **Key # FA-10** on inquiry card on page 69.

SHOE FOR INJURED FOOT

One answer to cutting down lost time caused by foot injuries, is a wooden-soled orthopedic shoe designed to keep workers on the job, marketed by the Reece Wooden Sole Shoe Co. It has a non-slip wooden sole and acts as a splint keeping the foot immobile and often eliminating the need for a heavy plaster cast. It has a soft airfoam inner sole for maximum comfort. Canvas uppers in either olive drab or white are adjustable to any size bandage and allow air to pass through freely. The shoe can be worn on either foot.

For details, use **Key # FA-11** on inquiry card on page 69.

COMBINATION SHOWER & EYE-WASH FOUNTAIN

A safety shower with new "ratchet-type" valve operation has been combined with a new cast-aluminum emergency eye-wash fountain by the Haws Drinking Faucet Company. This Model 8359 combines emergency body-drench and eye-wash facilities in a single, simplified unit for protection against injury from volatile fuels or dangerous chemicals. Units are furnished complete, ready for installation.

The "ratchet-type" quick opening ball valve on the drench shower is operated by a convenient nylon pull rope. The valve stays open until the ratchet valve rope is pulled again. The eye-wash unit in a new design has two fountain heads at each side, angled so that a controlled stream flushes directly into the patient's eyes. The "push-to-operate" ball valve opens instantly, remaining open until manually closed.

For details, use **Key # FA-12** on inquiry card on page 69.

EMERGENCY OXYGEN UNIT

A portable oxygen unit which supplies 51 minutes of the important gas for use in case of heart attack, electric shock, and other emergencies is announced by the NCG Division of Chemetron Corp. Incorporated into its line of inhalation therapy apparatus the Metrox equipment is made by Metrox, Inc. The "NCG-Metrox" contains 305 liters of oxygen and is equipped with a regulator which can be adjusted to supply from 3 to 12 liters per minute at a constant flow. A gauge shows oxygen pressure in the cylinder. Each unit is equipped with a plastic mask which has intake and exhaust valves. The intake valve permits entry of outside air if the hose from the tank becomes clogged or kinked, and the exhaust valve pre-

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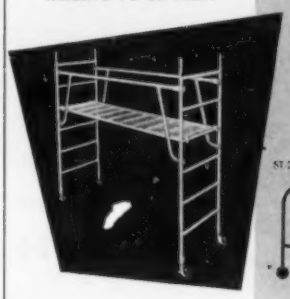

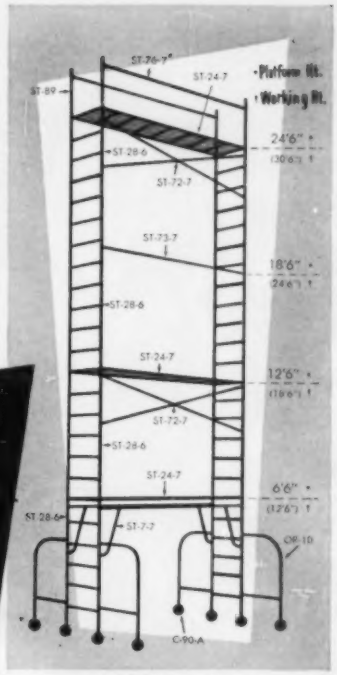

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(For details, use Key # M-9 on card on page 69)

vents rebreathing of exhaled carbon dioxide. Also furnished is a carrying case, a refilling adapter and wrench for refilling from standard oxygen supply sources. A smaller model with 56 liters of oxygen, or nine minutes' supply, is also available.

For details, use **Key # FA-13** on inquiry card on page 69.

FOUR FIRST AID KITS

Four industrial first aid kits are being sold by the American Optical Company's Safety Products Division. The kits range in size from ones containing 10 first aid items to kits with 36 items. Marked with large blaze-orange letters on charcoal gray cases for quick and easy identification, the kits are made of 20-gauge steel and have reinforced electrically-welded joints to provide maximum protection. Lids fit snugly, and a special rubber gasket keeps out moisture and water. Wall brackets, carrying handles and snap locks are built into each case. Contents include compresses, bandages, antiseptic swabs, tourniquets, inhalants and burn salves.

For details, use **Key # FA-14** on inquiry card on page 69.

FIRST AID FOR ROCKET FUEL BURNS

A phosphate buffer called Neutralize is gaining prominence in the rocket and missile industry as a treatment for skin and eye burns caused by liquid launching fuels. Developed by the E. D. Bullard Co. as an antidote for acid and alkali burns, it washes off and counteracts the outer layer of the chemical, then the layer of chemical next to the tissue. Suitable for burns from the hydrazine family of poisons (which are miscible with water and alcohol, and form salts with inorganic acids), and Antiline, which combines with acids to form salts. Burns caused by fuming nitric acid, kerosene and hydrogen peroxide respond to lavage with either water or Neutralize, but only a small amount of Neutralize is required according to the maker. Available in 2, 4, 8, 32-ounce, 1 and 5 gallon polyethylene bottles.

For details, use **Key # FA-15** on inquiry card on page 69.

(Continued on page 52)

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First Aid Developments

(from page 49)

RESCUE BREATHER UNIT

A new compact, lightweight adjunct for mouth-to-mouth resuscitation, called the MSco Rescue Breather, is announced by Medical Supply Co. Small enough to be carried in the rescuer's pocket, purse, auto compartment, or first aid kit, the unit features a flexible, tightly fitting facepiece that fits all faces, child or adult. It is simple to use and, extending only one inch into the victim's mouth, cannot stimulate the gag reflex. The bit block can be wedged between the victim's teeth to open the mouth in case of a jaw spasm. There are no valves or moving parts and the equipment is easily cleaned and sterilized.

For details, use **Key # FA-16** on inquiry card on page 69.

FIRST AID EYE & FACE WASH

A new eye and face wash safety fixture for on-the-job first aid to persons injured by acid splashes, caustics, fumes or dust has been developed by Speakman Co. Engineered for use in laboratories, chemical plants, metal plating shops, foundries, etc., the units may be installed at exact points where hazards exist. It is operated simply by depressing a large, easy-to-locate handle on the right side of the fixture. Twin water outlets flood the user's face with an 8" x 9" curtain of aerated water. Each outlet has three spray shields which form the water pattern. Water flows at 10 gallons per minute at 15 to 18 psi running pressure. Available in three models: wall-mounted, pedestal-mounted, and a built-in work table model. The pedestal model can be equipped with a frost-proof valve for outdoor installations. All models can have hose and aerated eye wash outlet for victims in the prone position.

For details, use **Key # FA-17** on inquiry card on page 69.

RESUSCITATION KIT

A newly designed E & J Emergikit Resuscitator has been introduced by Ohio Chemical & Surgical Equipment Co., Division of Air Reduction Co., Inc. The unit features a longer case to enclose and protect the cylinder regulator. Both the Emergikit I and II have retained their original features which include a power aspirator with plastic trap jar, preset positive and negative pressure at safe limits; a warning signal if the patient's airway is obstructed and means to convert the resuscitator to straight flow of oxygen.

For details, use **Key # FA-18** on inquiry card on page 69.

EMERGENCY COLD PACK

The problem of producing an ice pack when no ice is readily available is solved by Kwik-Kold—a plastic package of chemicals that becomes an instant cold pack for fast first aid treatment. It provides 20°F. cold within two seconds after being activated by simply squeezing the package. It stays that cold for about 30 minutes. A product of International Latex Corp., Kwik-Kold consists of an outer bag containing chemical crystals and an inner bag containing a liquid. A slight pressure on the entire package breaks open the inner bag and the cold is produced when the two chemicals mix. The contents are said to be absolutely harmless in the unlikely event that the outer bag should be punctured. The flexible package molds itself to the various parts of the body. Can be stored for more than two years.

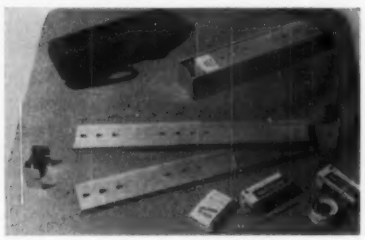
For details, use **Key # FA-19** on inquiry card on page 69.

RESCUE BREATHING KIT

The American Optical Company's Safety Products Division has started distribution of Ambu, a light, rugged, portable rescue-breathing kit. It contains a resuscitator to give air and start breathing again, and a foot-operated suction pump to clear the breathing passages fast. As a supplement to the approved mouth-to-mouth rescue breathing technique, the kit can be taken anywhere and put to work instantly by one person because it requires no electricity or other connections. The resuscitator bag holds 1,000 cubic centimeters of normal atmospheric air and will deliver up to 700 cubic

centimeters into the lungs when squeezed. This is usually more than can be delivered by mouth-to-mouth breathing but less than an adult's lungs hold so there is no danger of rupturing tissues.

For details, use **Key # FA-20** on inquiry card on page 69.



FIRST AID KIT CASE CONVERTS TO SPLINTS

The Redi-Splint First Aid Kit, featuring an aluminum container that converts into a splint set, is announced by Rock Royal Corp. In an emergency, the kit can be immediately disassembled, first aid supplies deposited in the container bag, and a splint (either regular or traction) constructed in a matter of seconds. The extruded aluminum case is extra strong and light weight. It is available with a full complement of first-aid supplies and is enclosed in a water-repellent canvas container for easy handling and storage.

For details, use **Key # FA-21** on inquiry card on page 69.

NEW AMBULANCE COT WHEEL

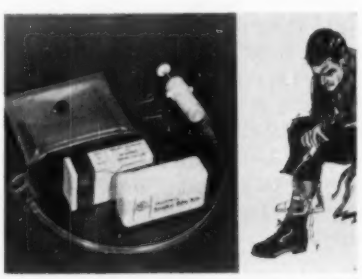
More headroom in ambulance or other emergency vehicles is afforded by a new 4" wheel that has reduced the over-all height of Ferno ambulance cots. The new wheel has a cushion tire with 60% greater tread width and an improved tread design for quiet, shock-absorbing operation. The company claims for its new model all the rolling and riding benefits of larger wheels. The new wheel has a lifetime lubricated, precision-made ball bearing for smooth, effortless movement.

For details, use **Key # FA-22** on inquiry card on page 69.

BURN RELIEF SPRAY

A fast-acting aerosol spray for burns, G-63, has been introduced by General Scientific Equipment Co. Packaged in 8-ounce spray-on cans, the product coats the skin with a protective and invisible film that isolates the burn, speeds the healing process and provides immediate relief from pain, the company reports. G-63 eliminates the need for bandages, reduces swelling, and guards against secondary infection through the use of Hexachlorophene. Its pain-reducing agent is an analgesic.

For details, use **Key # FA-23** on inquiry card on page 69.



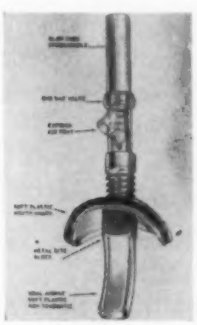
EXTENSION TUBE FOR SNAKE BITE KIT

An adapter extension accessory to the MSco Saunders' Snake Bite Kit for easily applying instant first aid to any bitten area of the body has been introduced by Medical Supply Co. The new accessory includes a flexible, clear 15" surgical tubing with suction cup and adapter that fits on the kit's standard pump. This lets the user easily reach and maintain suction on any bitten area of the body. The new adapter extension has greater fluid capacity and permits a longer period of suction without removal from the bitten area and incisions. Packed in handy 2-unit size it fits neatly into a unit system first aid kit or double-belt pouch.

For details, use **Key # FA-24** on inquiry card on page 69.

M-TO-M RESUSCITATOR

A simply operated mouth-to-mouth resuscitator for home or industry, has been announced by Willson Products. No. 1 Brook Airway has a non-return valve and expired air vent to prevent foreign material or exhaled air passing from the mouth of the victim to that of the rescuer. The blowtube is easily removable for cleaning and sterilizing. Flexible neck on the airway permits use in awkward positions. The clear, pliable mouthguard seals the mouth, permits a view of the color of the lips, and is held with the same hand that maintains optimum head-back, chin-up position.



For details, use **Key # FA-25** on inquiry card on page 69.

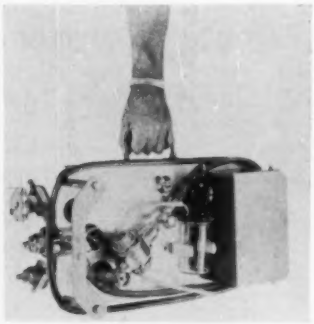
EMERGENCY DRENCH SHOWER

A new drench shower has been introduced by Haws Drinking Faucet Co. A short pull on the valve chain causes the ball valve to instantly release a deluge of water

at 34 gpm (under 40 lbs. pressure). It continues to flood the contaminated person until the chain is pulled again. The reliability of Haws special ratchet action valve eliminates any chance for valve "drift" which might cut the flow of water in an emergency.

The shower head is satin chrome finish cast brass with a 10" diameter adjustable face.

For details, use **Key # FA-26** on inquiry card on page 69.



COMPACT RESUSCITATION KIT

Globe Industries, Inc. has developed a new low-cost lightweight, two-cylinder resuscitator kit known as the Compact II. It includes the versatile Seeler resuscitator valve, an aspirator, two medical "D" cylinders and a metal box for the facepieces, airways and other items. All components are mounted on a single rigid plate, ready for instantaneous use. An ambulance model permits mounting on a hook in an emergency vehicle. Covered model is enclosed in a hard case or heavy-duty canvas bag. Can be used in areas of limited accessibility and through openings as small as 14 inches in diameter.

For details, use **Key # FA-27** on inquiry card on page 69.

Federal Safety Survey

Decrying the waste of human resources caused by accidents, Senator Hubert H. Humphrey, Minnesota, has called upon the Budget Bureau to "investigate the safety programs of all Federal agencies." Senator Humphrey represented President Kennedy at the annual President's Safety Award ceremony in the Departmental Auditorium.

Secretary of Labor Arthur J. Goldberg presented the top Federal safety awards to Veterans Administrator John S. Gleason, Jr., James E. Webb, Administrator of NASA, and to AEC Chairman Glenn T. Seaborg.

Mr. Goldberg also read to the Government safety men a Presidential message calling on all Federal agencies to establish "vigorous accident prevention programs" to assure the safety of civilian and military personnel, both on the job and off-duty.

The Chief Executive's injunction, calling for safe working conditions and safe work practices on the part of all Federal supervisors and employees, was spelled out in a "Safety Policy for the Federal Service."

In addition to the three top award winners, honorable mention certificates were awarded by Assistant Secretary of Labor James J. Reynolds to: Navy Department, Commerce Department, and Civil Service Commission.

The safety awards are made each year to the Federal agencies having the most outstanding record of performance in preventing job injuries during the preceding calendar year. Guided by rules set up by the Federal Safety Council, a panel of safety experts from private industry this year selected the winners from among 19 eligible agencies.

VA Administrator John S. Gleason, Jr., in accepting the top award for agencies with more than 75,000 employees, said there must be a "sweeping away of the old fatalism that 'accidents will happen,' and that they happen to 'the other guy'."

NASA's record highlights its "unique role" in aeronautical and space pioneering. "We have had to develop new types of safety rules to govern performance of work that is often extremely hazardous," according to Administrator James E. Webb. NASA won top honors in the 10,000—75,000 employee class.

For AEC, winner in the less than 10,000 employee group, the award marks its third win in 4 years. AEC won the award in 1957, 1959, and 1960. Dr. Glenn T. Seaborg, AEC Chairman, said that while many people know of the destructive power of atomic energy, all too few are aware of the never-ceasing emphasis AEC puts on safety for employees and the public.

The text of President Kennedy's "Safety Policy for the Federal Service" is as follows:

"In accord with our national concern for human life and the well being of all citizens, it is the policy of the Federal Government to safeguard from injury all those who work for it.

"To carry out this policy, I charge the heads of Executive departments and agencies and, through them, their supervisory staffs to exert leadership in the establishment of vigorous accident prevention programs to achieve safe conditions of employment, and to promote safe practices by civilian and military personnel on and off duty. Safety programs of the Federal Government should also assure the fullest protection to all who visit our Federal buildings, installations, parks, forests, and other public areas. Similarly, these programs should extend to the safety of the public and Government driver alike, in their use of our public highways.

"In order that these programs meet current needs and reflect the rapid changes in both technology and character of the working force, the Federal Government will cooperate with management, labor, State and local governments, and safety organizations in developing and applying modern safety standards.

"The Government will take all appropriate means to foster the safety of all of those engaged directly or indirectly in the world-wide activities of the Government. To this end, I have directed the Secretary of Labor to provide assistance to all agencies through the Federal Safety Council and its field affiliates."

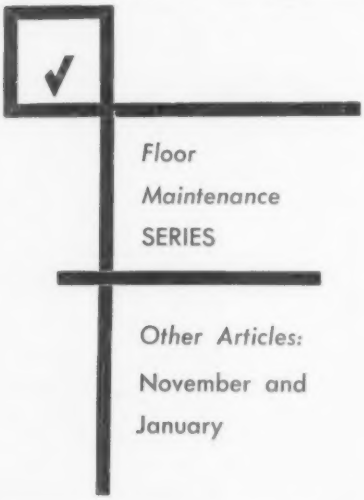
MAINTENANCE

- Tips On the Care & Cleaning of Concrete Floors
- Crawlers Needn't Hibernate
- Maintenance Conference to Stress Management Techniques

THE AND OF FLOORS

by The Engineering Department
Puritan Chemical Co.
Atlanta, Ga.

The most important factor in the appearance and upkeep of your concrete floor is its original construction. If it is properly mixed, and if it is put down according to the specifications of the Portland Cement Association, you will find it easy to maintain. If it is not properly built, then eventually it may "dust," crack, and accumulate unsightly stains. However, you can take certain maintenance steps which will to a great degree overcome these problems. They cannot make up for poor construction, but they can help you get good appearance and longer wear in spite of it.



SEALING NEW CONCRETE FLOORS It is almost universally agreed among contractors, architects, building managers, and maintenance men that the sealing of indoor concrete floors is highly desirable. For example, Mr. C. E. Boettcher, foreman of plant services for the Mimeograph Company, which has 500,000 square feet of concrete floors in its Chicago plant, expressed it clearly in an address before a national meeting of the Institute of Sanitation Management:

Shall we gamble against odds and do no sealing, hoping that we will get a reasonable length of wear out of our investment? We know that "dusting" never stops once started. It is an unending maintenance headache. It gets into equipment and products. It is a menace to the health of employees. And spillage seeps right into the floors when there is no seal to stop it! Stain removal is difficult at best and often impossible. . . .

I will agree that cost is of prime importance and cost reduction is a cardinal requisite in every sanitarian's life. In striving for a cost estimate we cannot consider an unsealed floor as zero cost and a sealed floor at cost of application plus maintenance labor plus materials. There is a

definite labor saving in various areas with a sealed floor.

Obviously, if sealing of the concrete floor is to give its greatest advantage, the time to do it is immediately after the floor is laid.

Here are the steps to follow:

Step 1: Be sure that the floor is properly cured. Curing is the process by which the cement mixture combines with water to fuse together. The Portland Cement Association states that concrete, if kept moist, will cure almost indefinitely. However, one week is their recommended curing period for most ordinary purposes.

There are several ways to promote the proper curing of newly laid concrete. In the past, it was often done by covering the concrete floor with about 1 inch of water, or by covering it with strips of burlap bags of Kraft paper.

In recent years, a better method of curing has been developed. It is the use of a polymeric concrete curing aid that is sprayed or mopped directly on a new concrete surface one hour after trowelling.

One or two coats of this curing aid are sufficient to promote the complete cure of the floor. The polymer forms a thin membrane over the floor which retards evaporation of water. This keeps water *in*

TIPS ON CARE CLEANING CONCRETE

— PART 1

How to Remove Stains from Concrete

1. ***Oil and Grease Stains***

   Frequent and repeated scrubbings with a neutral cleaner with an oil solvent added. Allow sufficient time between scrubbings for remaining oil to rise to the surface.

2. ***Ink Stains***

   Apply a paste made of sodium perborate, water and whiting (chalk) in a quarter inch layer; allow to remain until dry. Repeat several times if stain is stubborn. (Try your drug store or hardware store when buying the chemicals mentioned in these suggestions.)

3. ***Cigarette Stains***

   Simple abrasive and scouring powders scrubbed on with steel wool.

4. ***Coffee Stains***

   Cover with an absorbent cloth saturated with glycerin diluted with water. If this doesn't work, try the remedy suggested for tobacco stains.

5. ***Tobacco Stains (and Uric Acid Stains)***

   Apply an alkaline poultice of tri-sodium phosphate, chlorinated lime and whiting. Also a good method to use for removing uric acid stains in toilet rooms. In extreme cases, stains will yield to a 20% muriatic acid solution, but will scar the floor.

6. ***Paint or Varnish Spots***

   A paste made of tri-sodium phosphate; allow to stand for several hours and keep moist during that time.

7. ***Iodine Stains***

   Apply ammonia and cover with whiting or talcum powder; leave for several hours.

8. ***Rust Stains***

   Soak with a solution of sodium citrate and water, sprinkling a thin layer of hydrosulphite crystals over it; moisten with water and cover with a stiff paste of whiting and water. Leave on for an hour, remove and rinse thoroughly. Douse severe rust stains with chlorinated lime, commercial bleach, or a 15 to 20% solution of muriatic acid. The latter treatments will scar the floor if not applied with care. After harsh treatment, apply a sealer to strengthen and protect the area.

9. ***Acid and Alkaline Stains***

   An alkaline cleaning agent should be used on an acid stain and an acid on an alkaline stain. If doubt exists, test first on an inconspicuous area.

the floor and promotes more effective reaction and more complete cure. Simultaneously, the curing aid helps to seal and dustproof the floor. If you do not have a sprayer, you may apply this combination curing aid and seal with a mop or lambswool applicator. This can be done about 4 hours following the final trowelling, or as soon as the surface is hard enough to permit use of an applicator.

One of the great advantages of this new type polymeric curing aid and seal is this—it will harden in less than an hour after it is applied. The curing goes on thereafter for many weeks and continually produces the maximum structural strength. This seal is colorless, nonskid, and easily accepts other surface finishes and filling materials over itself after the cure is complete. The seal prevents dusting or "blooming." It also prevents the penetration of greases into concrete, or the adhesion of paint, soil, or plaster that may fall from walls or be tracked in during construction. It is also highly resistant to moisture and to acids, alkalis, oils, and other harmful chemicals.

The cost of future maintenance of a floor that has been covered with a polymeric curing aid an hour after trowelling is tremendously reduced throughout the decades that follow.

Step 2: Once you have applied the curing aid, allow it to dry for 4 to 24 hours without any traffic. Then normal traffic is permissible. You do not have to neutralize or etch a new floor with muriatic acid if a curing aid is used. It eliminates the complicated etching procedure.

Step 3: Wait about 60 days after the curing aid has been applied, then clean the floor and apply one coat of a permanent concrete seal.

If you have waited 60 days to apply the permanent seal, then be sure to clean the floor by a thorough scrubbing before you put down the seal. Wet the floor with hose or mop, then apply a synthetic powdered concrete cleaner or a liquid detergent to the surface. Let it stand, then scrub the floor with a floor machine or deck scrub brush. Pick up the dirty solution with a wet vacuum. Rinse, then vacuum again.

It is important that the floor be thoroughly dry before the new seal is applied. If no wet vacuum is available, use a squeegee to remove the water from the floor. If the floor has not been evenly laid, or if it was not designed to drain properly, then extra care has to be taken to see that the squeegee removes all water. Let the floor dry overnight with no traffic—before applying the new coat of seal.

APPLYING PERMANENT SEAL TO NEW FLOORS

Seals should not be applied on a rainy day or a day with very high humidity. Humidity directly affects the drying time of the seal. A sealing operation is also aided if the area being sealed is well-heated.

In some locations it is necessary to apply a fast-drying seal in order to prevent too long a tie-up of a working area while seal is being applied or drying. If speed is the most vital factor, then a phenolic type of seal which has a drying time of only one-and-a-half hours under conditions of normal humidity would be advantageous. However, if you use a product designed for fast-drying alone you may be sacrificing some of the long-wearing characteristics available in the slower-drying seals.

Where medium drying time is allowable—in fact, in all cases where a hard, durable concrete seal is desired—the new urethane-based floor seals are recommended. Some types, based on polyurethane components, will dry tack-free in 4 hours, and may be exposed to traffic in 6 to 8 hours.

To apply the seal, you will need a mop and a squeegee or lambswool wax applicator, and a seal pan. Fill the seal pan half full and immerse the applicator pad. Press the pad against the side of the pan so the applicator is drip free when lifted from the pan. Apply the seal in straight, even strokes 3 to 4 feet long.

A tip for custodial personnel: *Avoid bending the back when applying seal or wax. Stand close, do not overreach the area immediately at your feet. If you keep a straight back and limit your strokes to 3 or 4 feet, your work will be less tiring. It will go faster, too.*

When applying seal, carefully "feather" your overlap strokes to avoid lap marks and an uneven appearance. Do not apply pressure to the applicator; the weight of the applicator itself is enough.

Another tip: *Always read the label of the product before you begin applying a seal. The label will give you exact directions on how to use the product and how to apply it.*

"See what the boys in the back room will have."

SEALING NEW FLOORS WHERE NO CURING AID IS USED

If for some reason a new concrete floor is to be sealed, but no combination curing aid and seal is used, then the floor must be neutralized or "etched" with muriatic acid before sealing. Here are the steps in such a procedure:

Step 1: Cover the surface with water or with moist Kraft paper or wet burlap, and allow the water to cure the concrete for 7 days. (To hold water in place, build a little "dyke" of sand all around the edge of the floor. The water inside this "dyke" should be about one inch deep to start with.)

Step 2: After the floor has been in use for 60 days, it may be sealed. Before sealing, rinse it with neutralizer, mopped on. Here's an important tip:

Always pour the neutralizer into the bucket of water; never pour the water into the acid. Always use rubber gloves when applying neutralizer.

Allow the neutralizer to remain on the floor 5 to 15 minutes, then remove it. The best way to pick up

(Continued on page 61)

Overburden removal by crawler at Indiana strip mine continues despite winter's grip due to careful operation.

Proper preparation for winter operating conditions makes crawlers perform satisfactorily in the hardest weather.

Crawlers Needn't Hibernate

CHECK-OUT YOUR WINTER MAINTENANCE SCHEDULE

by L. R. KEITH
Assistant General Supervisor—Service
International Harvester Company
Construction Equipment Division

In past years, winter above the Mason-Dixon line meant the end of most construction work. Now, new products and new techniques often make it possible to work through the coldest weather.

Crawler tractors are a basic construction tool and they become even more important in wintry regions where poor traction sidelines other types of equipment. Although especially adaptable to winter, crawlers, too, need preparation to meet the challenge of sub-zero weather and frozen terrain.

No equipment in poor mechanical condition will start and operate properly in winter weather. Worn parts that may have been adequate during the summer season fall down completely with the first freeze. Quick diesel starts depend on good compression through sound ring and valve performance. The injection system must be timed to deliver fuel at just the right instant through nozzles, or injectors, that spray fuel accurately with no dribbling.

Ignition System

The ignition system must be correctly adjusted and in good shape. Worn wiring and poor connections set up a terrific resistance during low temperatures. Battery condition is probably the most important single factor in the starting picture. A full charge must be maintained at all times. At 10° batteries lose 50% efficiency; thus, with only an 80% charge, you will be fighting a losing battle. At —20°, even fully-charged batteries become balky. The quickest way to bring them back to life is to submerge them in warm water to within two inches of the top plates. Check battery levels every week and add water when necessary. Use only distilled water for maximum battery life. Do not overfill, or the expanding electrolite may be forced out of the vent holes and damage surrounding metal parts.

All gaskets, especially at the cylinder head and manifolds, must be in good condition. Check all hose connections to prevent leakage of costly anti-freeze. And on the subject of anti-freeze, the permanent type, Ethylene Glycol, is recommended for diesel use. Denatured alcohol boils at 173°F, thus requiring low temperature thermo-

stats which are inefficient during cold weather. Most equipment owners find it advantageous to pre-mix their anti-freeze solution in large quantities. Then, when make-up coolant is needed, there is no guesswork required as to the strength of the mixture and no wasteful overuse of anti-freeze "just to be on the safe side."

Special Equipment

There are many special attachments that make the operation of a crawler tractor more efficient during the winter season. Radiator shutters are probably the most commonly used. By keeping them closed during starting and opening them as needed after the engine has reached operating temperature, fast warm-ups can be provided and working temperatures can be stabilized in the efficiency or "Run" range.

Crankcase oil temperatures also require regulation. Ideally, coolant and crankcase oil temperatures should be as close together as possible. Here's the reason:

Everyone is familiar with the need to fill fuel tanks in the evening. If space for air is left inside the tank, moisture in the warm air will condense on the cool metallic interior of the tank, allowing water to mix with the fuel. Inside the engine, if either oil or water temperatures are too low, condensation may form on the outside surface of water passages or the inside of oil compartments. Condensation inside an engine valve cover is a frequently seen example.

Hood side doors help to raise and equalize engine temperatures. A canvas housing also does a good job and has the added advantage of providing summertime warmth and comfort for the operator.

High temperature thermostats will maintain higher engine temperatures, but check your operator's manual before installing them, as some model tractors will also require a differently-calibrated heat indicator.

Many attachments are available to make cold water starting quick and easy. If your diesel crawler has an inbuilt gasoline starting system, a primer is available to inject raw gasoline into the intake manifold. Six to eight pumps of the primer prepare the engine for instant sub-zero starts.

Direct starting engines may be equipped with an ether injection system. This highly volatile liquid fires quickly and will have the largest diesel running smoothly in three to four minutes.

Another diesel starting system uses glow plugs to warm the combustion chambers. A minute and a half of pre-warming with the glow plugs will usually have the engine ready for a first try start. Of course, the glow plugs must be in good condition and delivering their rated voltage. Never try to supplement the operation of poor glow plugs with ether priming fluid.

To round out the list of special winter equipment, don't forget that cutaway sprockets and special ice or snow track chain grousers are valuable additions in many crawler applications.

With your crawler mechanically ready for winter, now install the correct lubricant to meet your lowest expected temperature.

If temperatures in your area dip below 10°F, SAE 10W crankcase oil and SAE 80 multi-purpose gear lube will do the job. From —10° to —25°, dilute 10W lube oil with about 10% kerosene and use sub-zero gear lube MIL-L-10324. Since lube oils have a tendency to thicken in use, it's a wise move to add one quart of extra kerosene to the crankcase each week.

Extreme Temperatures

If you are really up in Polar Bear country, where temperatures sink below —25°F, crankcase oil that meets Military Specification MIL-0-10295 is specified. MIL-L-10324 gear lubricant is still satisfactory. Your oil supplier or construction equipment distributor can furnish information on brands of lubricants that meet these specifications.

Before installing winter-weight oils, warm up the engine and exercise the tractor to bring all lubricants up to operating temperature. In this way, more sludge and contaminants will be carried away when the compartment is drained.

When adding oil to the crankcase, fill the filters separately. Oil then will be instantly available for bearing lubrication. After changing oil, run the tractor without load for five or ten minutes before putting it to work. This allows the thinner winter oil to work into the cylinder walls and bearings.

Use the same weight oil in the air cleaner as is used in the crankcase. Heavy oils often act as a choke and cause hard starting. Although winter operation is generally not dusty, don't neglect recommended crankcase, filter and lubrication servicing requirements. In spite of all your precautions, there will still be a greater chance for condensation to form in your fuel tank and crankcase, and for moisture to damage other lubricated parts. Service the fuel line water trap daily. If it becomes overfull, the water could freeze and break the glass container.

Operating Tips

With a gasoline starting system, use fresh, winter-grade gasoline. Protect it in sealed containers to prevent evaporation of the volatile, lighter ends. Don't forget to operate the engine on the gasoline cycle before shutting the engine down. This assures your engine dry, clean spark plugs when it's time for the next start. And always leave the engine with the change-over lever in the diesel position. This allows the starting valves to cool evenly on their seats.

Your operator's manual provides complete instructions for operating the direct-start ether injector, but here's one point to remember: *Operate the engine with the primer in the "injection" position only long enough to provide a successful start, with the engine running smoothly.* Four minutes is the maximum time needed to inject ether in even the lowest temperatures.

No matter what type of starting system your crawler uses, inbuilt gasoline, direct or glow plugs, only use the starting motor for about 30 seconds at one time. Then let it cool off for several minutes. The need for prolonged cranking usually indicates that the machine is not correctly adjusted or that the starting technique could be improved.

Another tip that applies to all types of crawlers: Make sure the

transmission is in neutral and the engine clutch disengaged before hitting the starter button. Why ask your overworked batteries to turn over any more weight than necessary.

Remember—the most critical period of cold weather operation is when the unit is first put to work in the morning. Care should be taken in warming up the tractor. Not only the engine, but the whole tractor should be moved and warmed up gradually to get all parts well lubricated before putting them under heavy load. Cold weather operation naturally puts more stress and strain on all moving parts. It makes good sense then that everything possible should be done to reduce the wear and tear that occurs at low temperature.

Winter operation can only be classified as severe—on both machines and personnel. It may never be pleasant, but careful preparation plus correct operating techniques can make winter operation highly practical.

Pictures from International Harvester Co.

Cleaning Concrete
(from page 58)

the neutralizer is with a vacuum. Make sure the vacuum has a stainless steel tank—the acid will attack a galvanized tank. Also make sure the vacuum hose is a vinyl or neoprene hose. If no vacuum is available, the neutralizer may be picked up with a mop.

Whether you use a vacuum or mop, rinse the floor **thoroughly** after neutralizing. Then allow it to dry thoroughly.

Step 3: Apply one primer coat and one permanent coat of seal. (In some cases, one coat of seal may be adequate. In a few, three coats are needed.)

A penetrating seal is required as a primer coat at this stage. Where speed is the overriding factor, use a quick-drying seal as the primer coat. When it is dry, apply a phenolic seal.

Where fast-drying is not the overriding factor, use a polyurethane seal, as the primer coat. Allow it to dry 4 to 6 hours before applying a coat of urethane permanent seal.

SEALING OLD CONCRETE FLOORS

The first step before sealing an old concrete floor is to remove the soil. If possible, clean the floor thoroughly. Let the detergent stand for 3 to 5 minutes, and it will do its job chemically better than you can do it with hard labor at that stage.

After the detergent has been applied, scrub the floor with the floor machine, using a wire brush. If you do not have a floor machine—and any building with a large area of flooring, whether concrete or any other type, should have one—use a heavy deck scrub brush for this cleaning.

If there is a heavy crust of grease, as in a machine shop, use a solvent type detergent to clean it. In severe cases it may be necessary to scrape the floor first with a floor scraper to get the top crust off. Then proceed with the cleaning operation described above. *Whatever you do, be sure to get all grease deposits off.* In many cases it is wise to clean the floor, then wait several days to see if oil creeps up out of the floors by capillary action. If it does, then do the cleaning operation a second time.

Now that the floor is clean, you can go ahead and apply the seal just as described above—a quick-drying primer and phenolic seal if fast-drying is the overriding factor; a polyurethane primer and urethane wherever speed is *not* the overriding factor but toughness and durability are.

Neutralizing is not usually necessary with old floors, although certainly it can do no harm. Sometimes it is considered a good safety precaution. If the floor is smooth trowelled, then it *must* be neutralized to open the pores and provide a good bind for the seal.

Important note: *If the concrete floor has a lapidolith (case-hardened) finish, sealing is not normally recommended. Lapidolith surfaces do not provide a good bonding surface for a seal.*
If the floor is a kalmon type, sealing is recommended, but only after the floor has been thoroughly cleaned and neutralized (or etched).

(To be continued in the January issue)

Maintenance Conference To Stress Management Techniques

A new emphasis on management techniques will feature the next Plant Engineering & Maintenance Show & Conference at Convention Hall, Philadelphia, Jan. 22 through 25. This shift of emphasis is a departure from the themes of the past 12 years and is made necessary by vast new areas of scientific knowledge and engineering skills which have been developed since the show and conference started in 1950.

Although many of the 43 conference sessions will still be devoted to discussions of preventive maintenance, repairs and inspections, new subjects have been added to cover management techniques, previously applied only to production methods, which may now be used in the areas of plant engineering and maintenance. Included will be such topics as cost control, operation-time control, work sampling, personnel relations, motivation of supervisors, plant communications and similar tools of management.

L. C. Morrow, consulting editor of "Factory," will continue to serve, as he has since the beginning, as general chairman of the conference. Clapp & Poliak, Inc., New York, produce both the exposition and the technical meetings.

The exhibits this year will be of unprecedented variety and scope. The show will occupy the largest exhibit area in its history with more than 400 companies exhibiting.

The 67 speakers and chairmen who will lead the discussions are drawn from a wide geographical and industrial area. They do business in 19 states and two Canadian provinces, and are involved in some 40 basic industries.

Visitors may obtain show and conference information from Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y. Rapid registration cards, to save time in registering for the show, and inquiry time saver plates, to assist visitors in obtaining information at exhibit booths, also may be obtained from the same source.

WHAT'S THE LAW?

Edited by HENRY M. GROSMAN
Counselor at Law, Newark, N. J.

MEMBER . . . . . .
Master Superior Court, New Jersey
American Bar Ass'n, New Jersey Bar Ass'n,
Chairman, Committee on Workmen's
Compensation, New Jersey Bar Association
National Federation Insurance Counsel
Past Commander, American Legion, Post 10,
. . . . . Newark, N. J.

ACCIDENT ON THE WAY TO WORK—Employer's Provisions for Transportation—Incident of Employment

Claimants worked as carpenters and had to travel 12 to 60 miles each day to their jobs. They took turns driving, but on the morning in question they rode to work with the superintendent in a truck owned by him, the use of which was paid for by defendant. There was an accident and claimants were injured. There was evidence that the superintendent invited claimants to ride with him in order to save money. They were paid by the hour and this did not begin until they began working. Further testimony showed that the employer did not furnish transportation or expenses in connection with getting to and from the job. Compensation was denied.

Injuries sustained by an employee while going to or returning from his regular place of employment are not, as a general rule, deemed to arise out of and in the course of employment. But there are exceptions to the rule, one of which is where the employee is riding in the employer's conveyance as a result of an actual or implied contract or as an incident of the employment. While the truck could be considered as operated by the employer, the transportation was not the result of an actual or implied contract. Affirmed.

Dickinson vs. Central Construction Co.; Arkansas Supreme Court. No. 5-2343. March 27th, 1961.

FINDING OF COMMISSION—Substantial Evidence Force and Effect of Jury Verdict—Control over Work-Injury on Land Leased by Claimant.

Claimant, a pulpwood hauler, was severely injured when a dead tree fell on him breaking a leg, three ribs, tearing loose four other ribs, and injuring his kidneys, pelvis and abdomen. Compensation was denied because there was not sufficient evidence to show that claimant was an employee of defendant. The Commission's findings must be affirmed if supported by substantial evidence. Defendant exercised no control over the work of claimant. Cutting, loading, and hauling of the wood were left to the discretion of claimant. Furthermore, he furnished his own tools and employees and the injury occurred on land leased by him. Affirmed.

West vs. Lake Lawrence Pulpwood Co.; Arkansas Supreme Court. No. 5-2406. May 22, 1961.

RUPTURED ULCER—Stepping in Hole While Holding Log—Claimant's Testimony Given More Weight Than Expert Testimony

Claimant was employed as an edger by defendant, who owned and operated a sawmill. He lifted a piece of lumber weighing over 10 pounds, stepped backwards into a hole, and felt a tear in his stomach. He was taken to the hospital where surgery was performed on a ruptured ulcer. Claimant testified that his stomach didn't bother him until he stepped into the hole. The doctor testified that he didn't think muscular activity could cause a rupture such as the one suffered by claimant. However, he said with such an ulcer anything is possible The director found for claimant and this was affirmed by the Superior Court. Such a finding by a director of the Workmen's Compensation Board is conclusive if there is evidence to support such a finding. In a case such as this where the fact of injury is uncontradicted and all that is to be decided is whether it is compensable, claimant's testimony is given as much if not more weight than that of an expert because claimant can best tell if the injury complained of existed before the accident. Affirmed.

Truelove vs. Hulette; Georgia Court of Appeals. No. 38595. April 20, 1961. Vacating judgment of opinion reported at PP 1749.

FINDING OF BOARD—Must be Sustained When Supported by Substantial Evidence

Decedent worked on a conveyor from which he pulled boards into bunks, sorting them by grade of lumber as he did so. On one or two occasions decedent complained of shortness of breath, but one evening while working, he pulled on a board, then suddenly collapsed. An autopsy showed moderate sclerosis of the right coronary artery of the heart and extreme arteriosclerosis of the left coronary artery. Compensation was denied. The weight and credence to be given evidence is for the Industrial Accident Board to determine. The Board's findings when supported by substantial competent evidence, must be sustained, even though there may be other conflicting evidence. Affirmed.

Sutton vs. Brown's Tie & Lumber Co.; Idaho Supreme Court. No. 8915. May 8th, 1961.

INSIDE THE TRADE

Vernon R. Haack has been appointed Dallas Regional Manager for the *Industrial and Marine Division, WALTER KIDDE & CO., INC.* He previously served as District Sales Manager at Kidde's Detroit Regional Office. Mr. Haack has spent 14 years in the fire safety equipment field and joined Kidde in 1958. He attended Lawrence College and is a member of the American Society of Safety Engineers.

John A. Gwin has joined *JOMAC INC.* as sales representative for the company's Midwest territory comprising Chicago, Northern Illinois, and Wisconsin. He will work from Jomac's Chicago sales office at 4832 North Lincoln Ave.

Ground was broken recently for an addition which will be erected adjacent to the present *R. D. WERNER CO.* plant at Greenville, Pa. The new addition will add 53,000 square feet to the present plant. Expansion plans involve the installation of specially designed high-speed equipment which will greatly increase Werner's output.

Election of three vice presidents to fill new corporate offices has been announced by *SPEAKMAN COMPANY*. Elected to the new posts were *George Chester*, vice president, secretary and treasurer; *James R. Masterson, Jr.*, vice president-manufacturing and *John J. Traynor*, vice president-sales.

Chester was previously secretary and treasurer of the company. Masterson was promoted from his former position as plant manager. Traynor, in addition to new duties as vice president, will continue as general sales manager of the company which manufactures showers, plumbing fixtures fittings, and industrial safety equipment.

Creation of the new corporate offices is the latest in a series of reorganization steps undertaken by 92-year-old Speakman Company to expand markets and increase sales and production.

A number of changes in the sales organization of *Minneapolis-Honeywell's MICRO SWITCH* division have been announced by J. K. Lincoln, sales manager of the division. *C. T. Morison*, former branch sales manager in Washington D. C., has been named branch sales manager for the New York office. Morison replaces *William Betz*, who has been appointed aircraft products sales manager of Honeywell's Precision Meter division in Manchester, N. H.

Replacing Morison in Washington is *Floyd M. Cassidy*, former market manager for aircraft, missiles, ordnance and marine applications. Cassidy's duties have been assumed by *Donald Schultz*, who has been transferred from Micro Switch's Charlotte office to Freeport.

The appointment of *Rowland Erving* as Director of Market Research, a newly created post at *THE MCKAY CO.* has been announced. In his new position, he will be responsible for exploring the sales areas of the company's products: chain, welding electrodes and wires, automatic welding equipment, and tire chains. He joined the company in 1929 and has been Sales Manager of the Chain Division since 1958. Prior to that he was Assistant Sales Manager, Chain Division.

T. J. Simendinger, 10 year veteran in Yale hoist sales, has been named hoisting equipment product sales manager, *Yale Materials Handling Division, THE YALE & TOWNE MFG. CO.* His duties will include product production planning and scheduling to meet distributor and customer requirements and the supervision of product improvement programs. He joined the company in 1951 and had been serving as district sales manager for eastern Pennsylvania, southern New Jersey, Delaware and Maryland since 1956.

In a modification of its marketing organization, *THE BLACK AND DECKER MFG. CO.* has named *Arthur S. Boehm* to the newly-created position of sales manager of its industrial-automotive division. Mr. Boehm was formerly eastern region sales manager and has been with the company since 1934. In his new position, he will directly supervise all district managers of the division and will report to Glen H. Treslar, general sales manager of the division.

At the same time, *Lester C. Kaefer*, formerly Pacific region sales manager, became district manager of the newly-formed Pacific Coast district. *Thomas H. Maddux*, formerly Central region sales manager, has been named sales manager of Master Power Corporation, the Black & Decker air tool manufacturing subsidiary with headquarters at Solon, Ohio.

Appointment of three departmental managers for *PITTSBURGH PLATE GLASS COMPANY* paint and brush division research and development center at Springdale, Pa., has been announced by Dr. H. L. Gerhart, director, research and development. Appointed were *Dr. Henry A. Vogel* as manager, consumer products development; *Dr. Pierson G. Boermans* as manager, trade sales technical service, and *Robert P. Ericson* as manager, industrial coatings development.

Joseph C. Loeb, Jr. has been appointed Branch and Area Sales and Service Manager for the Indianapolis branch office of *AMERICAN FLOOR MACHINE CO.* subsidiary of American-Lincoln Corporation. Also appointed was *Melvin W. Lamb* as Office and Service Manager. The announcement was made by Mr. J. H. Davidson, Vice President of Marketing of the parent corporation.

CASSIDY PRODUCTS, INC. announce the appointment of *Paul W. Watten* to the position of National Sales Manager. He will expand the sales and

ANNOUNCEMENT

Re: Safety Vests

The United States Patent Office has allowed claims covering the "RAY–D–8"* Safety Vest of Industrial Products Company, Philadelphia, Pennsylvania, and will issue Letters Patent. Infringers will be prosecuted to the full extent of the law.

* "RAY–D–8" is the registered trademark of Industrial Products Company, 2820 North Fourth Street, Philadelphia 33, Pennsylvania.

(For details, use Key # M-10 on card, page 69)

service organization for the entire Cassidy line of floor machines and vacuum cleaners. Mr. Watten will start the concentrated organization of Cassidy distribution on the East Coast and will work to improve the distributor program.

A. W. McGregor, president of *ROBBINS & MYERS, INC.*, has announced the formation of a new division to be known as the *Airtrol Division*, with headquarters in Springfield, Ohio. Airtrol will specialize in unit type collectors for the control of dusts and mists encountered in industrial and commercial operations. Airtrol products will be nationally distributed by approximately 40 manufacturers' representatives, many of whom have already been appointed. The Robbins & Myers Company of Canada, Ltd., Brantford, Ontario, will serve as the Canadian outlet.

E. J. Stone, sales manager of the company's Propellair Division, has been assigned managership duties for the new Airtrol Division. *M. I. Dorfan*, well-known dust control authority, has been given the responsibility for performance and testing of the new line.

BELL & GOSSETT CO., manufacturers of heating, air conditioning and electronics equipment, has announced four new appointments in the firm's *Hydro-Flo Division*. *Herbert Miesfeldt*, named sales coordinator, will be responsible for administrative matters relating to products, pricing and order handling. *James Jordan* has been appointed field sales manager in the Centrifugal Pump Department. *James Rippel* is assistant products manager, Hydronic Accessories Department; and *Robert Anderson* fills the same post in the Centrifugal Pump Department.

Three major promotions are announced by *TOWMOTOR CORP.*, manufacturers of fork lift trucks and other material handling equipment. *Daniel M. Wessman*, formerly assistant sales manager, moves into the position of assistant to the executive vice president. His duties will include special assignments in sales and distribution and responsibility for nationwide service operations. *Alfred H. Roth*, who has been in charge of advertising and sales promotion, was named manager of marketing and advertising. *W. L. Utley* becomes assistant to the president in addition to his current post as assistant secretary, with special responsibility for sales to government agencies, representation of the company in trade associations and coordination of Towmotor's foreign licensing program.

J. Wallace Anderson was appointed Branch Manager in charge of *AMERICAN-LINCOLN CORPORATION*'s Pittsburgh operations. He will represent its subsidiary *American Floor Machine Co.* as well as the *American Power Tool* and the *Lincoln Floor Machinery Co.*, divisions of the corporation. Mr. Anderson was with the Clarke Floor Machine Company for fifteen years as Divisional Sales Manager before joining American-Lincoln.

Chester H. Sanderson

Chester H. Sanderson, advertising manager for *MINE SAFETY APPLIANCES CO.*, Pittsburgh, for the past 12 years, died of a heart ailment at his suburban Penn Hills home on October 1, 1961. Mr. Sanderson was with the company 34 years. A World War veteran, he was a member of the Association of Industrial Advertisers and B.P.O. Elks.

The appointment of *Tina Vicini* as Publicity Director of the *HILD FLOOR MACHINE CO.*, was announced by Joseph Roti, President of the Company. Miss Vicini formerly was Assistant Publicity Director for the Biddle Company, in Chicago.

The appointment of *John Schafer* as a sales engineer for the *Scientific & Process Instruments Division* of *BECKMAN INSTRUMENTS, INC.*, has been announced by Robert A. Piper, Manager, Midwestern Region. Schafer will represent the division in North Chicago, Wisconsin, Minnesota, North Dakota, and Michigan in the sale of the complete line of Beckman laboratory instruments. His headquarters will be the Beckman Chicago office.

HERCULITE PROTECTIVE FABRICS CORP., has announced the appointment of *Herman R. Wittrock* as technical sales adviser to fabricators of Herculite Fabrics. Mr. Wittrock was formerly head of Ernest Chandler, Inc. In addition to his role as technical sales adviser, he will take over technical sales responsibilities in Herculite's newly organized Packaging Department.

ACME PROTECTION EQUIPMENT CO. announces the appointment of *Felix Grabau* as Assistant Sales Manager. Mr. Grabau has spent many years not only as Safety Director, but also as Sales Specialist in Respiratory Equipment, with an enviable record as instructor and lecturer on respiratory and resuscitation methods and equipment.

MARBELOID SAFE-T-TRED CO., a new organization headed by *Sidney Shane* of West Hartford, Conn., long prominent in the floor covering industry, has been formed for the manufacturing and marketing of an abrasive non-skid floor surfacing material for stores.

The new corporation will share manufacturing space with the Marbeloid Corporation in North Bergen, New Jersey, another Shane corporation, which manufactures terrazzo and magnesite flooring material.

John Bulhert was named the Installation Manager and *Robert H. Elwington* Sales Manager. In addition to a sales staff at it's main plant in North Bergen, the new company will maintain field sales offices in Hartford, Conn., New Haven, Conn. and New York City.

Vincent Brass & Aluminum Co., 124 12th Avenue South, Minneapolis, Minn. has been appointed a stocking distributor of non-sparking safety tools produced by *AMPCO METAL, INC.*

John P. Scanlan has joined *MULTI-AMP Electronic Corp.* to assist in sales engineering of electrical test and calibrating units for checking relays, circuit breakers, other protective devices and meters, also high-voltage units for testing insulation. He was formerly a district engineer for Mutual Boiler and Machinery Insurance Company, serving the Middle Atlantic District over 19 years.

John T. Monahan, general manager of *AMERICAN OPTICAL CO.'S Safety Products Division*, was elected a trustee of the National Safety Council. His election came on the opening day of the Council's five-day annual meeting in Chicago.

Monahan joined American Optical in 1944 as a development engineer. He held many positions with the company until his promotion last year to his present post.

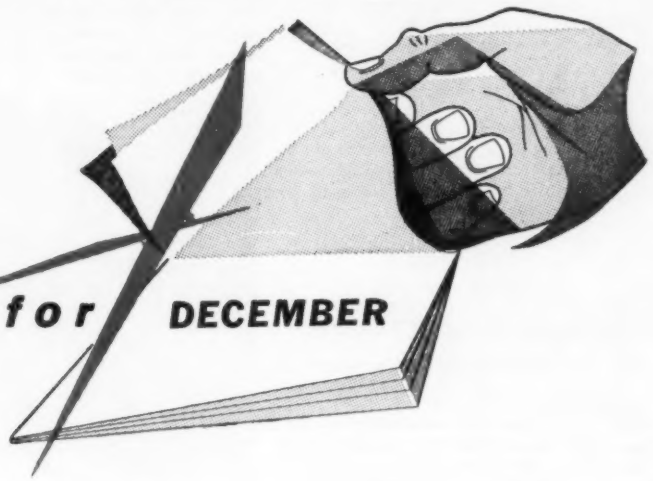
Safety Personnel

Appointment of *M. R. Beebe* as supervisor of health physics has been announced by Allis-Chalmers Safety Services. He succeeds J. W. Baum, who has joined the staff of the University of Michigan. Beebe will be responsible for corporate staff programming in radiation and nuclear safety and will provide staff safety coordination for its Atomic Energy Division.

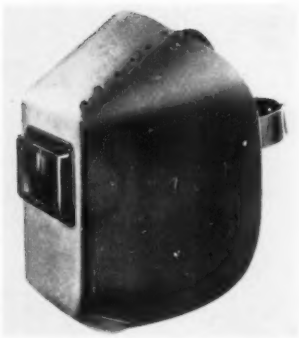
Beebe was a health physicist at the Republic Aviation Corp., Farmingdale, N. Y., and with the Brookhaven National Laboratory before joining Allis-Chalmers. He is recipient of an AEC Fellowship in radiological physics and a certified health physicist.

Material appearing in this section is published as information and is not intended to imply endorsement or guarantee by this publication.

To obtain descriptive literature of products listed, use Reader's Inquiry Card. Write in code number given each item. Send written requests to: Service Dept., 75 Fulton St., New York 38.



what's new for DECEMBER



LIGHTWEIGHT WELDING HELMET

(Use Key # 822 on Inquiry Card on page 69)

THE American Optical Company's Safety Products Division has started production of a light-weight inexpensive welding helmet made of fiber. The 13-ounce helmet features a new aluminum plate holder and has adjustable friction joints and adjustable headgear. Seams are widely overlapped and coated with a rubber sealant to prevent light leakage. This helmet is recommended for light welding, intermittent use and for use in confined quarters.

EXPLOSIVE GAS DETECTOR

(Use Key # 823 on Inquiry Card on page 69)

A NEW safety device that indicates the concentration of explosive gas has been developed by Beard Instruments, Inc. The Gas-O-Larm Detector, Model 350, indicates the percentage below explosive concentration of flammable gas. It operates on the catalytic platinum filament principle and may be calibrated for any flammable gas, such as utility gas, gasoline fumes, or other hazardous vapors in industrial plants, public utilities, chemical plants, mining, etc. The unit operates on dry cell batteries for portable operation and is actuated by an electrically operated probe containing a detector element. Factory calibrated for methane and ethane gases, it can be calibrated for other gases at the request of the customer. The calibration curves in the instrument case show the actual gas percentage for the specified gases. Housed in a leather case, and also contains spare detector elements.

SAFETY FEATURES IN DUST MOP RENTAL

(Use Key # 824 on Inquiry Card on page 69)

MOPS treated with MYCOS-45 minimize slip hazards and reduce the spread of disease caused by dust-borne bacteria. Dust mops, so treated, are available

through the MYCO Dust-Mop Rental Service, established by the Masury-Young Co. More than 85 franchised industrial laundries, covering over 90% of the country, now rent MYCO mops, frames and handles to industrial plants, retail stores, offices, hospitals, schools and other types of buildings.

Light-weight MYCO Dust Mops are easy to handle because they are made flat to fit under counters, desks, heavy furniture and machines. The mop heads—in 52", 38", 30" and 22" sizes—can be locked into a fixed position or into a swivel position. After each laundering the mop heads are treated with a special agent that penetrates mop fibers. The mops pick up dust, dirt, lint and harmful abrasives by electrostatic forces as well as by absorbency. The dust control agent is also a germicidal agent which inhibits fungus and bacterial growth rendering the mops germ proof.

The rental service cuts maintenance costs. Customers pay only the equivalent of laundering. Franchised industrial laundries provide complete mops, pick up soiled mops and deliver clean ones.

INSULATED WINTER LINER

(Use Key # 825 on Inquiry Card on page 69)

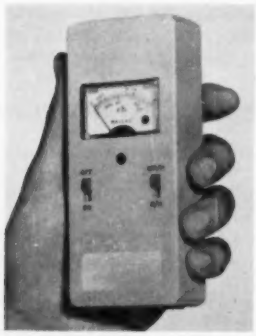
AN INSULATED hard hat liner designed to fit snugly inside all makes of safety hats has been developed by the Refrigi-Wear Clothing Co., specialists in the manufacture of severe weather clothing for industry. Made of a durable, water-repellent nylon outershell with an absorbent cotton lining and a polyester fiber insulation, the quilted hood liner assures head, neck and facial warmth in the worst of wintery weather. It features three adjustable securing straps, and comes in a soil-free brown color. One size fits all. Sold on an unconditional money back guarantee. Quantity discounts available.

ECONOMY WELDER'S GLOVE

(Use Key # 826 on Inquiry Card on page 69)

THIS NEW economy version of Singer's "Solo" glove meets the demand for a truly reversible but inexpensive glove. It has the same reversible feature as its higher priced companion, making it fit either hand with equal comfort. Can be purchased singly because right and left are identical —front and back are designed alike.

The glove is made of specially tanned cowhide treated for softness and shrink-resistance. The color is a distinctive Sea Green. Cuff is of flame-resistant Fire Chief duck in Olive Drab with red binding.



POCKET SURVEY METERS

(Use Key # 827 on Inquiry Card on page 69)

THE GELMAN Instrument Co. has introduced a low-cost Pocket Radiation Meter for the detection of radioactivity. This device may be carried in a vest or shirt pocket to keep handy for instant use as personal protection against fallout or industrial radiation in atomic plants, radioisotope laboratories, Civil Defense units, and by civilians. It weighs less than 8½ ounces and operates on ordinary penlight batteries or mercury cells. In normal use, the mercury cells would power the unit for more than a year. The meter is accurate at any temperature from —20°F to +140°F. Three different models are available, and each covering two individual ranges of radiation levels.

A special Civil Defense model of the meter is for use in home fallout shelters, by survey teams, military personnel, disaster crews, and for emergency surveys around nuclear reactors.

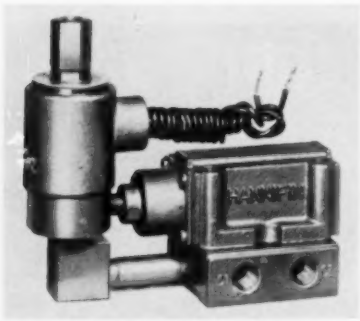
The Standard Range meter is designed for the radiation levels of radiochemical laboratories, radiation therapy equipment, de-contamination operations, and medical laboratories.

The High Range model is designed for use near any high strength radiation source like nuclear reactors or industrial radiography equipment.

PORTABLE GLOVE INFLATOR

(Use Key # 828 on Inquiry Card on page 69)

THE Portable Glove Inflator enables linemen to inspect visually high-voltage rubber gloves daily in the field. All makes of 14 and 16 inch rubber gloves can be used with the device. Specially compounded neoprene O-ring holds glove securely in groove at top of device. Unique elastic bellows, an integral part of the inflator, is pumped against a hard, smooth surface. Air is forced through one-way valve, the single moving part, inflating glove. The lineman can then inspect glove thoroughly. Supplements periodic laboratory inspection. The G-I Glove Inflator is manufactured by Continental Safety Equipment, Inc.



EXPLOSION-PROOF SOLENOID ACTUATORS FOR AIR VALVES

(Use Key # 829 on Inquiry Card on page 69)

A NEW LINE of explosion-proof solenoid actuators for use in hazardous locations is available for Series "CC" pilot-operated air valves from the Hannifin Company. The new actuators are suitable for Class 1, Group D and Class 2, Groups F and G hazardous applications. They are offered for both momentary and maintained contact, pilot-operated air control valves. They feature compact design, leakproof construction and large air flow capacity. Optional bottom ported bases, bottom and side ported bases and integral speed control sections are available.

MAINTENANCE EQUIPMENT LABELS

(Use Key # 830 on Inquiry Card on page 69)

TO MEET the need for a simple and easy labelling system for buckets, wringers, mop sticks, chemicals, containers and other supplies, Market Forge Co. is offering a low-cost package of five attractive labels with self-stick adhesive backing. The labels are imprinted "Disinfectant," "Solution-Strip," "Rinse," "Pick-Up," and "Wax." They are 6½" long and 1¼" high, in silver aluminum foil, embossed with bright green for easy visibility. The labels are available in handy plastic packets, each with five separate labels. Such a labelling system helps maintain the effectiveness of solutions and chemicals, reduces the possibility of contamination of solutions and equipment, and promotes systematic storage and proper usage of the equipment.

LINT-FREE CLOTHING

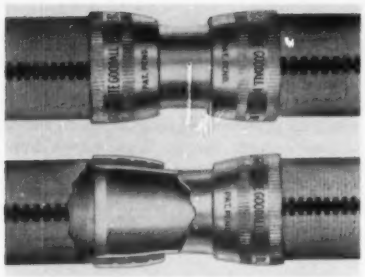
(Use Key # 831 on Inquiry Card on page 69)

A NEW lint-free fabric Dacron/Nylon warp knit Tricot, is being introduced in "Clean Room" apparel by Worklon, Inc. The garments are lightweight, and opaque. The fabric can "breathe," resists soiling, and will hardly ever ravel. Specially created styles in laboratory coats and coveralls are offered for use in Clean Rooms and other sensitive areas where product contamination must be avoided.

WHITE HYCAR APRONS

(Use Key # 832 on Inquiry Card on page 69)

HUB Safety Equipment, Inc., announces a low-cost, newly formulated line of White Hycar Aprons. These aprons have an exceptionally high resistance to acids, caustics, animal fats, cutting oils, petroleum and aromatic hydrocarbons. They have excellent abrasion resistance, are coated on both sides, and will not swell nor peel. Available in 30-gauge white Hycar.



FIRE HOSE MENDER

(Use Key # 833 on Inquiry Card on page 69)

GOODALL Rubber Company has just introduced a unique fire hose mender which requires no tools except a penknife to install. It is designed to fit 1½" single jacketed lined fire hose or unlined linen fire hose having an outside diameter not exceeding 1¾". Weighing about five ounces, it is made from a high tensile annodized aluminum alloy which meets Military Specifications Type I. Hydrostatic pressures up to 600-700 pounds per square inch will not cause leakage or collapse of the unit. It does not create any restriction of flow. It has F.M. approval. The unit is to be used as a temporary mender only.

LOW COST HEARING PROTECTOR

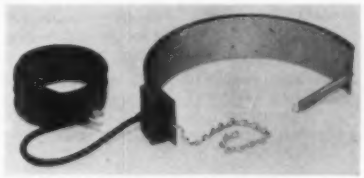
(Use Key # 834 on Inquiry Card on page 69)

BAUSCH & LOMB announces the new "Quiet Ear" hearing protector, designed for greater worker safety and comfort in industry, heavy construction, missile installations and testing areas, commercial or military airfields, etc. The lightweight (12 ounce) unit has a larger cup than the original model, yet its special construction provides better noise reflection than many styles with bulky ear cavities, the company states. Easily replaceable cushion and crown pads of polyvinyl chloride assure worker comfort over long periods, even if used with hard hats and safety eyewear. Padding material remains soft and pliable over wide temperature variations. The cups, of castle-gray impact resistant plastic, are attached to an easily adjustable headband which distributes tension evenly. Design changes and increased market volume allow considerable price reduction from the earlier model.

STAPH CONTROL PROGRAM

(Use Key # 835 on Inquiry Card on page 69)

DAMERON Enterprises, Inc., has developed a complete aseptic program aimed at controlling staphylococcus and other infections in hospitals, schools and other institutions. The program, which includes all necessary materials and methods, is built around a series of bacteriostatic and bacteriocidal products sold under the "Vi-Lan" trademark. In addition to aseptically cleaning and protecting the surfaces of floors, walls and ceilings, the program also includes the control of infection-laden dust. The program was tested for a year at a large Louisville hospital.



PROPANE BOTTLE WARMER

(Use Key # 836 on Inquiry Card on page 69)

A NEW attachment to prevent propane bottles from frosting on the job has been developed by the Morrison-Pelsue Co. The MoPeCo Bottle Warmer maintains the gas pressure in LP gas bottles and enables propane operated equipment to work efficiently in cold weather, yet requires only 10 watts of 115 volt AC or DC electric current. It attaches around the bottom of standard 12" LP gas bottles with chain and spring. GE calrod element furnishes sufficient heat to prevent frost from forming. It offers greater efficiency and lowered cost in utility operations by getting the full use from every bottle. A 10' cord plugs into the generator receptable on MoPeCo Ventilating Heaters, thus eliminating the need for auxiliary equipment.

SAFETY HOOK ATTACHMENT

(Use Key # 837 on Inquiry Card on page 69)

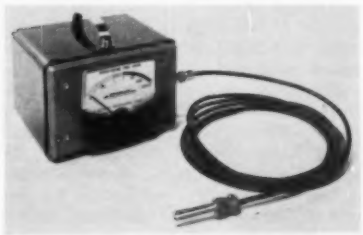
AN ATTACHMENT to the Thompson Type safety hook that converts existing lifting equipment to safety equipment has been introduced by Shepard Niles Crane and Hoist Corp. The new device, a special swivel-eye nut, easily attaches to a wide range of lifting devices. With the attachment, Shepard Niles Safety Hook can be used interchangeably on all existing machines of the same capacity: mobile crane trucks, construction elevators, ship board winch rigging, conventional cranes, hoist derricks, winches, wall, pillar or gantry cranes as well as towing rigs and load tighteners. Available in capacities from ¼ to 25 tons, it features a bronze safety catch which locks at two points, preventing the load from jumping off the hook. The hook provides a full throat opening when needed (by swinging catch to one side) and an 80% opening for normal use.

SHELTER RADIATION MONITOR

(Use Key # 838 on Inquiry Card on page 69)

ATOMIC Safeguards Corp. and R.E.A.C. announce jointly the introduction of radiation instruments designed specifically for fallout shelters. Called the Sensor, the device provides radiation level information of the immediate shelter vicinity by means of an extension sensing probe located outside the shelter.

The detector is contained in a waterproof housing and it is rugged enough to



withstand all ordinary hazards. The indicator is pushbutton operated to conserve flashlight battery life. The instrument dial is direct reading, with dangerous radiation levels shown in red. A cable (50 feet supplied) leads from the detector into the shelter and connects to the indicating unit. An optional probe on a 3 foot cable converts the unit to a portable instrument. Sensor is suitable for shelters for homes, offices, factory buildings, schools, etc.

ABRASIVE BLAST CONTROL

(Use Key # 839 on Inquiry Card on page 69)

INSTANT control by the operator, either manually or automatically, saves the most expensive item in blasting, i.e., the abrasive. This blast machine is held under pressure at all times and completely eliminates waiting for the pot to pressurize. The Abrasive-Miser makes moving around on scaffolding easier and safer without losing time signalling to the pot tender. It will fit onto any blast hose in minutes and no expensive time is wasted repiping the pot or making connections of any sort. Unit is made by L. C. Nesham Products Co.

PORTABLE RESCUE WINCH

(Use Key # 840 on Inquiry Card on page 69)

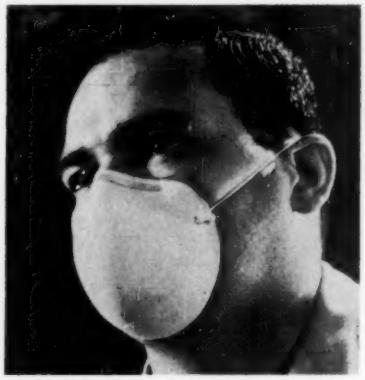
A NEWLY-DEVELOPED portable winch, easily operated by one person, can be used in rescue and safety work requiring lifting, pulling or tightening. Called the Mighty Muscle, this compact device weighs only six pounds, but can lift more than a ton. Designed for such tasks as pulling damaged cars apart, lifting heavy or bulky objects, straightening auto frames, and dozens of emergency jobs, the "Mighty Muscle" is less cumbersome and more versatile than block and tackle. A spring-actuated pawl and ratchet system provides solid safety, yet gives completely free release when desired. Equipped with 15 feet of strong 3/16-inch diameter aircraft cable. Longer cables are available, if desired. Forged steel hooks offer free-swivel action. The sturdy steel handle fits into any of eight handle position holes. Unit is unconditionally guaranteed against defects by Gra-Tite Mfg. Div., Gray Properties, Inc.

MEDICAL X-RAY GLOVES

(Use Key # 841 on Inquiry Card on page 69)

RAD-BAR medical X-ray gloves, the result of four and a half years of constant development and testing by Charleston Rubber Company, offer an entirely new concept in manufacture and in warranted protection for radiologists, roentgenologists and other users of X-ray equipment. Made of lead-loaded, non-toxic Du Pont neoprene, by an exclusive process developed by Charleston Rubber, "Rad-Bar" gloves are manufactured by the multiple dip process. They have no seams, no stitched areas and they contain no fabric. The gloves are contour shaped to fit the hand and have flared cuffs. Touch sensitivity and flexibility are unusual built-in features. They will be very specially welcomed for angiographic work. The gloves are comfortable, sensitive and have no clumsy bulkiness. Their smooth, chemical resistant neoprene surfaces are easily disinfected.

The gloves carry a six-month performance warranty. They have a guaranteed lead equivalent of 0.5 MM minimum, evenly and permanently dispersed, to provide complete shielding. The X-ray gloves are composed of several separate, precisely fitting, seamless plies of lead-loaded neoprene with air spaces between. There is no exposed lead. Inner and outer surfaces are of unleaded neoprene. The glove comes in four hand sizes, including an extra small size for women. There is also a one-finger mitten. The gloves are red on the outside and black on the inside. Two pairs of absorbent, white cotton inner-liners are furnished with each pair of gloves.



LIGHTWEIGHT FILTER MASK

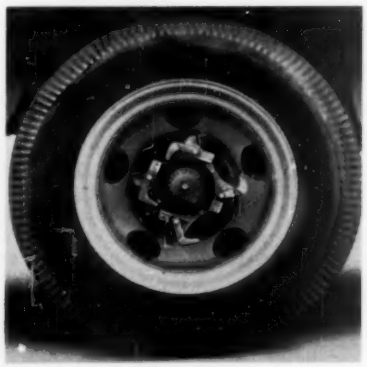
(Use Key # 842 on Inquiry Card on page 69)

A NEW featherweight filter mask that combines high filtration and comfort has been made available nationally to the industrial trades by Minnesota Mining and Manufacturing Co. The mask is designed for maximum filtration of non-toxic dust and sprays in woodworking, metal filing, sanding, spray painting, etc. Filter masks No. 8200 are made of a non-woven fabric and are shaped to stay away from the nose and mouth. An elastic headband seals the single-unit mask around the edges and a flexible metal nosepiece adjusts to fingertip pressure. The mask conforms to any face and allows easy breathing, unmuffled conversation and unobstructed vision. The cool, dry masks are reusable, yet inexpensive enough to discard after a single wearing. Masks are packaged 50 to a box and are available at industrial distributors.

CHAIN COUPLING LINK

(Use Key # 843 on Inquiry Card on page 69)

A NEW drop forged master link, designated as kuplink, for its line of Kuplex sling chains has been announced by American Chain Division, American Chain & Cable Company, Inc. The Kuplink combines for the first time the function of the master link and a coupler in one component. The need for the usual separate coupling device is eliminated as the coupler is an integral part of the master Kuplink. This means that when a load is set down a single leg sling can be withdrawn from under the load without snagging which might occur when a separate bulky coupler is used. Master Kuplinks are drop-forged alloy steel, heat-treated and Magnaflux tested to assure maximum quality. Each is factory proof tested to twice the working load limit of its corresponding size of alloy chain.



NEW BELL BACK-UP ALARM MOUNTING

(Use Key # 844 on Inquiry Card on page 69)

A NEW mounting device for the six-inch Bell Back-Up Alarm has been introduced by the E. D. Bullard Company. Known as the Quick Attachment Mounting, it facilitates installation and removal of the truck alarm. If it is necessary to change a wheel, the alarm may be taken off by removing one pin. The Quick Attachment remains in place, ready to accommodate the alarm when it is returned to position. The new attachment comes in a kit which includes two "U" straps, two shouldered bushing washers and the Back-Up Alarm, complete with mounting plate and locking pin. Can be used on delivery, dump and batch trucks, pick-ups, van and stake trucks, or any truck with an axle flange or dual wheels.

REDESIGNED RESPIRATOR

(Use Key # 845 on Inquiry Card on page 69)

ECONOMY and worker acceptance are just two of the many benefits of Mine Safety Appliances Company's redesigned Comfo respirator. An improved facepiece peripheral seal, including an inturned lip and deep chin cup cushion supported by a four-point floating suspension system, provides for a greater range of facial shapes and sizes. This minimizes the need for a full facepiece in areas of "nuisance" concentrations of contaminants or toxic dusts. Approved by the U. S. Bureau of Mines, the half mask is also employed as a component part of dust, chemical cartridge, and air line respirators. The yoke-type suspension distributes pressure more uniformly around facepiece periphery.— Unit is lightweight (only 4.3 ounces) and is made of a soft, durable Hycar rubber formulation that is resistant to facial oils, solvents, and thinners. Easy to clean and

(Continued on page 71)

LOSS STOPPERS

The free bulletins and catalogs reviewed below are offered by the Reader Service Department of this publication. To obtain copies without cost or obligation, write in the key numbers on the Reader's Inquiry Card.

MAINTENANCE

Lubricating Grease 375
Bardahl Mfg. Corp. This 32-page booklet summarizes the basic principles, properties, types and rules for choice and application of lubricating grease, including the effect of various additives on the properties of the grease.

Gratings & Stair Treads 376
Blaw-Knox Equipment Div. Illustrated, 8-page bulletin gives specification data on electroforged carbon steel and rectangular and interlocked aluminum gratings and stair treads for open flooring and stairs in steel, power, boiler, paper, chemical, food and numerous other industries.

Electric Cable Inspection 377
Balteau Electric Corp. Non-destructive inspection of cable terminations and splices by x-ray analysis is described in a technical bulletin which outlines the case history of this type of inspection in an actual plant.

Waste Disposal 378
Brule Incinerators. Waste and trash disposal by means of incinerators, for both large and small plants, is outlined in this folder. Includes operating features, types for installation through a wall, portable models, stationary types and specialized multiple-type designs.

Housekeeping Tools 379
Puritan Chemical Co. The use and care of tools for industrial housekeeping, such as mops, buckets, vacuums and floor machines, are discussed in this pamphlet, which gives tips on selecting tools efficient non-fatiguing use, and the care and storage of the equipment.

Coolant Filtration Equipment 380
Filtration Div., Hoffman Industries, Inc. This brochure offers illustrated case histories of how leading companies overcome metal-working production problems caused by coolant contamination. Indicates the cost savings, production gains, and maintenance economy of proper filtration of coolants.

High Quality Concrete 381
Master Builders Co. A comprehensive analysis of nine important factors governing high quality concrete production. Charts, graphs and photos show advantages of using a water-reducing, air entraining admixture for concrete.

PERSONAL PROTECTION

Plastic Goggle Line 382
Pulmosan Safety Equipment Corp. A complete line of plastic goggles, illustrating eleven different models, is described in this 4-page bulletin. Includes spectacle types, eye-shield designs, one-piece types and dust goggles. Bulletin also shows hardened-lens chipper's and welder's goggles.

Hand Protection 383
Keller Glove Mfg. Co. Illustrated 8-page catalog describes 69 different types of gloves, hand pads, mitts and sleeves made of a pile fabric for protection against cutting, abrasion, heat and other general hazards. Styles for light, medium and heavy requirements are offered, along with reversible types of gloves and mitts for economy.

Setting Up An Eye Safety Program 384
Fendall Co. Unusually informative and helpful booklet, "How to Install an Eye Protection Program," gives practical information and guidance in establishing a workable eye-safety program. It describes several types of programs and gives data on how to "sell" management on the need for the program.

Linemen's Gloves 385
White Rubber Co. Illustrated bulletin describes linemen's rubber gloves and one-finger mittens, leather protector gloves and mitts, low-voltage gloves, inner liners, glove bag and also a glove dielectric tester.

Self-Contained Breathing Apparatus 386
Mine Safety Appliances Co. Self-contained oxygen apparatus designed for rescue work and an accessory transistorized communication system are highlighted in a new bulletin. It describes the face pieces with which the 2-hour oxygen equipment can be used and gives full specifications for the respiratory equipment and communication system.

FIRE PROTECTION

Automatic Detection-Alarm System 387
Notifier Corp. This bulletin features the advantages and various components that make up U.L., F.M. and Canadian Standards approved automatic fire detection and alarm systems. Covers several detector units, control equipment, alarm devices, and coding and recording equipment.

Fire Extinguishers for Trucks 388
Fyr-Fyter Co. Bulletin gives data on a 2½-lb. dry chemical fire extinguisher, designed especially to meet the rough abuse

(Continued on the next page)

SPECIAL OFFER BELOW VALID ONLY FOR THREE MONTHS AFTER PUBLICATION DATE

READER'S INQUIRY CARD

HOW TO GET FREE DATA! **(No Postage Required)**

ADVERTISED PRODUCTS: Just insert the key number shown under each advertisement in the boxes below.
NEW PRODUCTS ("WHAT'S NEW" PAGES): Insert the key numbers shown on each item.
FREE BULLETINS & CATALOGS: Insert the key numbers shown on this page.
KEEPING UP WITH RECENT DEVELOPMENTS: Insert the key numbers shown on items in special feature article.

PLEASE PRINT YOUR NAME & ADDRESS

Name _____ Title _____

Company Name _____

Street Address _____

City _____ Zone _____ State _____

DECEMBER, 1961 **Please send me the following free data**

MAIL POSTAGE PAID CARD FOR MORE DATA

Loss Stoppers (Cont'd)

and vibration requirements of trucks, buses and other carriers. Complies with the regulations of the Interstate Commerce Commission.

Furnace Explosions 389
Babcock & Wilcox Co. Colorful, informative 16-page brochure analyzes the causes of 156 recent furnace explosions, discusses the theory of explosions during flameouts, and gives practical recommendations for safe operating procedures. Excellent diagrams and charts supplement the text.

Carbon Dioxide Extinguishing Systems 390
Cardox Div., Chemetron Corp. High-pressure carbon dioxide fire extinguishing systems are highlighted in a new bulletin that describes their operation in protecting "hot" spots and explains automatic, remote manual and direct manual actuations. Includes diagram of typical system layout and photos of components.

Static Electricity Neutralizer 391
The Portland Co. A self-induction type static neutralizer is described in this bulletin. Diagram shows locations for neutralizing bars to prevent fire or shock hazards on printing presses, conveyor belts, calenders and rewinders, coating machines, etc.

MISCELLANEOUS

Automatic Emergency Lights 392
Carpenter Mfg. Co. Battery-powered stand-by lights that operate automatically when lighting circuits fail are described in this 8-page catalog. It points out the advantages of both dry and rechargeable power supplies and includes data on how to specify emergency lights.

All-Plastic Carboy 393
Plastineers, Inc. This bulletin outlines the features of an all-plastic carboy approved by the I.C.C. for shipping chemicals without overpacking. It describes the carboy's chemical inertness, impact resistance, ease of handling, and ease of dispensing with a chemical pump.

What's Your Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, this publication will arrange to supply manufacturers' literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

Key Number	*Subject*
	PERSONAL PROTECTION
101	Safety Goggles
102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
105	Hard Hats
106	Respirators & Masks
107	Protective Clothing
108	Women's Protective Caps
109	Safety Belts
110	Safety Gloves
111	Electrical Gloves Tester
113	Daylight Fluorescent Vests
114	Welding Helmets
115	Fire Fighting Suits
116	Aluminizing Touch-Up Kit
117	Safety Shoes
	FIRST AID AND HYGIENE
120	Protective Skin Creams
122	Sanitary Drinking Facilities
124	Salt Tablets
125	Resuscitators
126	Antiseptic Medication
127	Burn Medication
127A	Poison Ivy Immunizer
127B	Poison Ivy Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
129A	Stretcher Cases
130	Throat Medication
131	Eye Wash Fountains
131A	Emergency Showers
132	Portable Ventilators
133	Dust Collectors
135	Hearing Protectors
137	Noise Mufflers (machines)
	FIRE PROTECTION
141	Safety Cans
142	Fire Alarms
145	Welding Curtains
148	Watchmen's Control System
149	Fire Blankets

Key Number	*Subject*
	LIGHTING AND WARNING DEVICES
150	Alarms & Warning Lights
153	Fluorescent Lamp Guards
154	Emergency Lights
155	Truck Back-Up Alarms
	MAINTENANCE
161	Anti-Slip Waxes & Finishes
162	Floor Cleaning Compounds
163	Floor Cleaning Machines
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192	Safety Awards & Emblems
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195	Changeable Letter Signs
197	Safety Training Films

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for further data on ADVERTISED PRODUCTS, NEW PRODUCTS, FREE BULLETINS & CATALOGS

WHAT'S YOUR PROBLEM?

maintain. The exhalation valve seat is made of Cycolac to increase service life and eliminate deterioration from sunlight or solvents. Exhalation valve has low resistance and a valve cover prevents accidental opening by winds or compressed air currents.

CHEMICAL RESISTANT FLOORING

(Use Key # 846 on Inquiry Card on page 69)

ROCKFLUX, a Flexrock Product, is engineered to flooring needs where acid, oil, grease and water are a problem. Packaged as a complete unit to which only water is added, Rockflux is used for patching and resurfacing old floors at a ½" or more, and as a practical finish for application over new, wet concrete floors. It has three times the compressive strength of concrete, four times the serviceability, and will absorb 75% less moisture. This quick, economical material has been proved successful in textile mills, canneries, creameries, breweries, tanneries, laundries, chemical plants, etc.

AUTOMATIC LIGHT CONTROL

(Use Key # 847 on Inquiry Card on page 69)

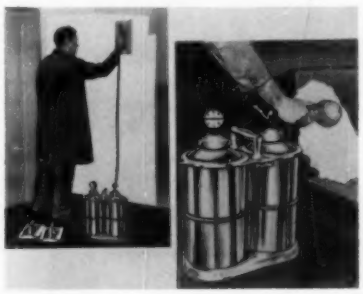
THE NEW automatic, on-at-dusk, off-at-dawn, plug-in street light control by Lightguard Electronic Mfg. Co., Inc. has an unusual power-saving feature. The design provides for simple screw-driver adjustment of the operating light level desired in the field, without removing the control from its receptacle. For example, the light operating level at dusk can be changed from ½ to 3 foot-candles. The foot-candle setting is shown in the light-admitting window in the side. Other new features of the Dialatrol include varistor surge-protection for the hermetically-sealed photoconductive cell, as well as a 1500-watt rating with incandescent lamp loads, elimination of trouble-causing capacitors and rectifiers from the circuit, an excellent lightning arrestor, and a tough aluminum case designed to resist impact of hail.

STATIC-FREE BELTING

(Use Key # 848 on Inquiry Card on page 69)

EXTREMULTUS has completed almost five years of extensive research into the problems of using belting in explosive and combustible atmospheres. As a result, it has developed a special "Non-el-Stat" static-free belting by bonding a conductive layer into the belt itself for permanent anti-static effect.

Applications of the belting range from chemical installations having highly explosive gases to food processing plants with combustible dusts. Although gas-air mixtures are generally considered more dangerous, dust-air mixtures can actually be set off at lower voltages.



COMBINATION WALL WASHER AND UPHOLSTERY CLEANER

(Use Key # 849 on Inquiry Card on page 69)

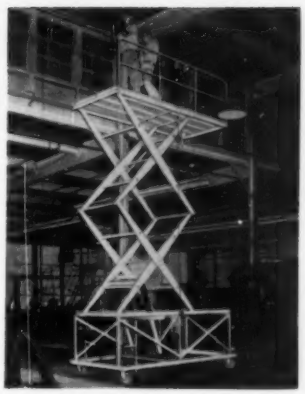
CALLED Silver-King Twin, a brand new combination wall washer and upholstery cleaner is announced by Thompson & Sons, Inc. This equipment consists of: (A) dual copper tanks which hold material for an 8-hour day of wall washing; (B) two valve-controlled trowels, designed for easy, comfortable operation, which are attached by "quick connector" to (C) 20 foot lengths of non-kink hose; (D) a third trowel for fast, lightweight drying. Highly perfected liquid cleaner completes the effectiveness of this unit, as a wall washer.

For upholstery cleaning, a valve-controlled white Nylon feed-through brush permits complete moisture control by the operator and, also important, the cleaning in one direction on fabrics. Detergent solution for use on upholstery is also available.

WORK PLATFORM LIFTS 1500 LBS.

(Use Key # 850 on Inquiry Card on page 69)

A HEAVY DUTY line of hydraulically adjustable work platforms, featuring platform adjustment ranges of up to 12' on standard models at the touch of a button, has been introduced by the Ballymore Co. New Series #61 Platforms are completely



mobile and have leveling jacks for stability on uneven or sloping floors. Can be adapted with road running gear and hitch for easy movement over the highway. Available in single or double scissor models. Platform working area has nonskid, self-cleaning serrated grating for maximum safety. Operation of the platform lift can be either electro-hydraulic or air-hydraulic with "dead-man" controls on the platform guardrail. The air drive operates on normal shop air pressure and is recommended where an explosion hazard exists. The model shown adjusts from 5½ to 17 feet.

RECOIL AIR HOSE

(Use Key # 851 on Inquiry Card on page 69)

NYCOIL, the nylon air hose that stretches and recoils, is now supplied with a compression elbow fitting and a new, "nonslip" aluminum ferrule. This type of assembly locks on the smooth surface of the hose and permits unobstructed air flow. If overtightened or subjected to severe pulling, the fitting remains and will not pull off. A new, steel spring guard prevents severe binding of the hose at the fitting, and eliminates kinking.

This lightweight air hose can be connected to any straight or pistol-type air tool or to equipment requiring air pressure up to 200 psi. It is not affected by oil present in air lines, and is resistant to abrasion and corrosive materials. Made by Nycoil Co., its bright, red color and self-storing ability contributes to safety and better housekeeping. Available in standard 25 foot lengths with positive-lock fittings on each end.

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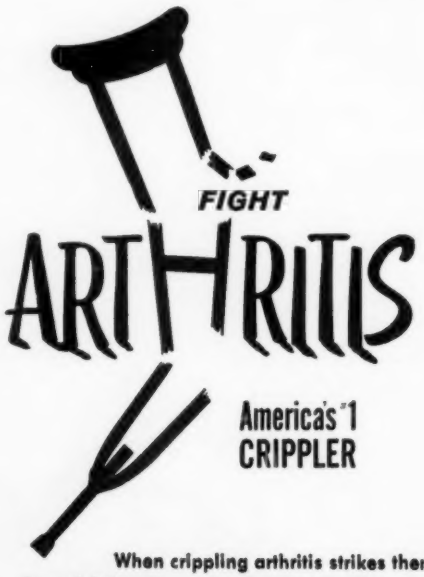

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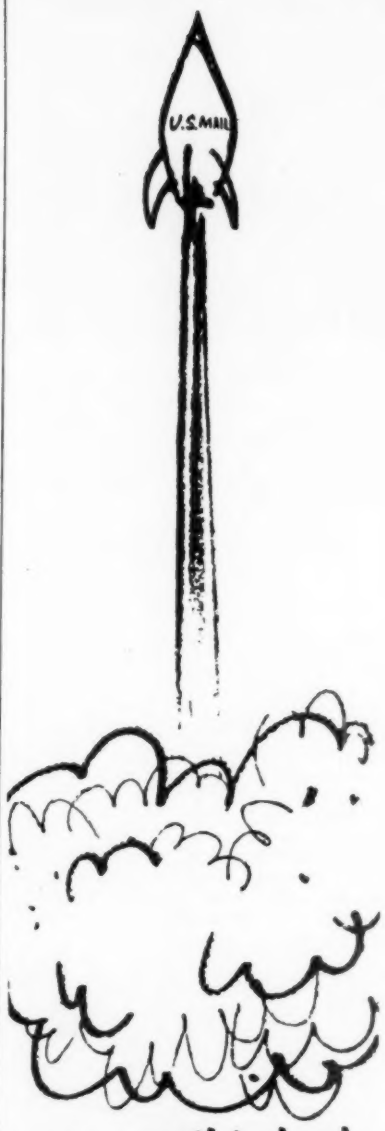
THE ARTHRITIS AND RHEUMATISM FOUNDATION



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(For details, use Key # M-11 on card on page 69)

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